



31st European Annual
**CONGRESS ON
SURGICAL INFECTIONS**

7TH - 9TH JUNE 2018, ATHENS, GREECE

Thursday 7th June 2018 – SIS-E Olympics

16:00-16:15	Welcome: I. Rubio-Perez, SIS-E Education Committee Chair. Chairs & Expert panel: Marjolein Blussé van Oudalblas, members of the SIS-E Council.
Presentation and discussion of the 6 best cases on surgical infections	
16:15-17:15	Cases 1-3 & Discussion <ul style="list-style-type: none"> 1- Diverticular pelvic abscess complicated with gluteal and thigh myositis and sciatic nerve impaired function Polyxeni Kizgala (Greece) 2- Acute diverticulitis or metastatic cancer? Comprehensive differential diagnosis of an abdominal mass associated with multiple hepatic lesions. Begoña Peinado (Spain) 3- Spontaneous fistulation of gluteal abscess to the peritoneal cavity – a rare cause of acute abdomen. Stavros Parasyris (Greece)
17:15-17:30	Coffee break
17:30- 18:30	Cases 4-6 & Discussion <ul style="list-style-type: none"> 4- The nightmare of infected mesh after incisional hernia repair: how should we proceed? Luis Asensio-Gómez (Spain) 5- Large abdominal wall hernia, infected mesh with fistula, morbid obesity and COPD: operation impossible or an interesting challenge? Max Ditzel (Netherlands) 6- Contained diverticular perforation conditioning fasciitis through the left groin due to extrusion of polypropylene mesh from previous hernioplasty Arantxa Villadóniga Sánchez (Spain)
18:30-18:45	Evaluation survey (feedback) & closing remarks
18:45-19:00	Selection of the best 3 cases. Prize giving
20:00	Networking Event & Drinks: Join us for informal pre-congress drinks to meet colleagues and start networking! All delegates and accompanying persons are welcome to this free event, but places are limited, please indicate on your registration form if you would like to attend. Rooftop Garden of the venue, Crowne Plaza Hotel

Friday 8th June 2018	
08:00 - 18:00	Registration
08:30 – 09:00	<p>Congress Welcome</p> <ul style="list-style-type: none"> • Marja Boermeester, President of the SIS-E • Ioannis Koutelidakis, President of the Hellenic Surgical Infection Society • Iordanis Papadopoulos, Congress President, SIS-E 2018 Athens
09:00 – 10:30	<p>Free paper session I: HBP & abdominal wall Chair: Kema Rasa (Turkey), Athanasios Marinis, (Piraeus, Greece)</p> <ol style="list-style-type: none"> 1. Early surgery versus step-up practice for chronic pancreatitis: a multicenter randomized controlled trial (Y. Issa,/M.A. Kempeneers) 2. Antibiotic use following spillage of bile and gallstones in laparoscopic cholecystectomy (AH van Dijk) 3. Evaluating eosinopenia and Neutrophil-to-Lymphocyte Ratio as outcome markers in patients undergoing cholecystostomy for acute cholecystitis classified by 2018 Tokyo Guidelines (B Peinado) 4. Efficacy of total pancreatectomy with islet autotransplantation on morphine and insulin requirement in chronic pancreatitis: a systematic review and meta-analysis (M.A. Kempeneers) 5. A systematic review of the pressure-induced vasodilation phenomenon and its role in the pathophysiology of ulcers (P.R Zwanenburg) 6. Incisional Negative Pressure Wound Therapy for prevention of postoperative wound complications – A systematic review and meta-analysis (P.R Zwanenburg,) 7. Comparison between biologic mesh and current management of the open abdomen in non-trauma emergency patients (J.J.M Claessen) 8. Long-term outcomes after contaminated complex abdominal wall reconstruction (J.J.M Claessen)
10:30 – 11:00	Coffee Break & Poster Round I
11:00 – 12:30	<p>Symposium I: Update on antimicrobial resistance Chair: George L. Daikos (Athens, Greece), Konstantine Vagianos (Athens, Greece)</p> <ol style="list-style-type: none"> 1. Resistant bacteria: who's who? Basics a surgeon should know Spyridon Pournaras (Athens, Greece) 2. Clinical & epidemiological impact of resistance in surgical patients Joe Solomkin (OASIS,USA) 3. Strategies against resistance & stewardship Jan De Waele (Ghent, Belgium)
12:30 – 13:00	Young Investigator Lecture: Improving diagnostic accuracy in vascular prosthetic graft infections

	<p>Chair: Sarah Gans (Amsterdam, Netherlands) Presenter: Ben Saleem (Groningen, Netherlands)</p>
13:00 – 13:30	<p>Semmelweis lecture Chair: Marja Boermeester, SIS-E President (Amsterdam, Netherlands) Surgical infection and oncological outcomes in cancer surgery Presenter: Prof. Malin Sund (Umea, Sweden)</p>
13:30 – 14:30	<p>Lunch & Sponsor Exhibition</p>
14:30 – 16:00	<p>Free Paper Session II: Colorectal & appendix Chair: Francesco DiMarzo (Forte dei marmi, Italy), Georgios Konstantoudakis (Athens, Greece)</p> <ol style="list-style-type: none"> 1. Interobserver variability in the classification of appendicitis during laparoscopy. (A.L. van den Boom) 2. Is eosinophil count a useful marker in acute appendicitis and can it predict pathological findings? (L Asensio) 3. Timing for appendectomy; is longer time to surgery associated with more complications in patients with complicated appendicitis? (W.J Bom) 4. Natural course of small pericolonic or mesocolic diverticular abscesses compared to uncomplicated acute diverticulitis. (ST Van Dijk) 5. A systematic review of colonoscopy after an episode of left-sided acute diverticulitis. (S.J Rottier) 6. WSES sepsis severity score for patients with peritonitis: is it applicable and useful for residents in the Emergency Department? (L Asensio) 7. Individual patient data meta-analysis of observational versus antibiotic treatment of uncomplicated acute diverticulitis. (ST Van Dijk) 8. Preventative measures for surgical site infection in elective colorectal surgery. A survey among Spanish colorectal surgeons (N Arroyo)
16:00 – 17:00	<p>A closer look at practice-changing Trials in Surgical Infections Chair: Ines Rubio-Perez (Madrid, Spain), George Polymeneas (Athens, Greece)</p> <p>Stijn de Jonge and Sarah Gans, (Amsterdam, Netherlands), Young SIS-E and SIS-E council</p> <ul style="list-style-type: none"> • LADIES Trial • DIRECT Trial • STITCH Trial
17:00 – 17:30	<p>Refreshment Break & Poster Round II</p>
17:30 – 18:30	<p>17:30 – 18:30 Symposium II: New Developments and spotlight topics in Surgical Infections (sponsored lectures) Chair: Helen Giamarellou (Athens, Greece), George N Zografos (Athens, Greece) 17:30-18:00 Complex abdominal wall reconstructions: planning and mesh choice</p>

	<p>(Bard sponsored) Prof. Marja Boermeester (Amsterdam, Netherlands) 18:00-18:30 Ceftazidime in complicated skin and soft tissue infections (Pfizer sponsored) Chair: Ioannis Koutelidakis (Thessaloniki, Greece) Presenter: Helen Giamarellou (Athens, Greece)</p>
18:30-19:00	<p>Keynote Lecture: The Role of Infections in Readmission following Major Surgery Donald Fry (SIS-NA, Surgical Infections Journal Editor, USA)</p>
21:00	Congress Dinner

Saturday 9th June 2018	
08:30 – 18:00	Registration
09:00 – 10:00	<p>Symposium III: The abdomen & infection Chair: Gregory Kouraklis (Athens, Greece), Iakovos Nomikos, (Piraeus, Greece) Relaparotomy in emergency surgery: planned or on-demand? Marja Boermeester (Amsterdam, Netherlands) Iordanis Papadopoulos (Athens, Greece)</p>
10:00 – 11:30	<p>Free Paper Session III: Infection prevention & surgical site infection Chair: George Giokas (Athens, Greece), Konstantinos Tepetes (University of Thessaly, Greece)</p> <ol style="list-style-type: none"> 1. Effectiveness of a nationwide bundle approach to reduce surgical site infection. An observational cohort study in the Netherlands (TAPAS study). (S de Jonge) 2. A survey to identify the breach between evidence and practice in the prevention of surgical infection among Spanish surgeons. (JM Badia) 3. Demonstrating success in reducing adult cardiac surgical site infections and the economic impact of using multidisciplinary collaboration (L Chiwera) 4. Prosthetic infection of Sacral Nerve Stimulation devices leading to explant: can it be prevented? (I Rubio-Perez) 5. Fighting the Resistance: Time to Rethink the Staphylococcus aureus Battle (RG Sawyer) 6. Postoperative continuation of antibiotic prophylaxis and incidence of surgical site infection. A systematic review and meta-analysis. (S.W de Jonge/QJ Boldingh) 7. Reduction of Surgical Site Infections in elective colorectal surgery after the first year of implementation of a bundle of care (JM Badia) 8. Surgical Site Infection in Elective Colon & Rectal Resections: Effect of Oral Antibiotics (A Ghuman)
11:30 – 12:00	Refreshment Break & Poster Round III

<p>12:00 – 13:00</p>	<p>Symposium IV. ‘Global Surgical Infections’ Joint Symposium with WSES, SIS-NA Chair: Joe Solomkin (OASIS, USA) Key concepts in management of the open abdomen for infection source control Massimo Sartelli (WSES Representative, Italy)</p> <p>New published guidelines on prevention of ACS/SSI surgical site infection guidelines Kamal Itany (SIS-NA President, USA)</p>
<p>13:00-13:30</p>	<p>Antifungal therapy for the surgical ward patients. Chair: Stefanos Geroulanos (Athens, Greece), Christos Katsios, (Ioannina, Greece) Anastasia Antoniadou (Athens, Greece)</p>
<p>13:30 – 14:30</p>	<p>Lunch & Sponsor Exhibition</p>
<p>14:30-15:15</p>	<p>Meet the Editor: tips and tricks to publish your paper on Surgical Infections Prof. Malin Sund (Umea, Sweden), Editor of BJS</p>
<p>15:15 – 16:00</p>	<p>Pro/Con Debate: Mechanical bowel prep to reduce SSI for colorectal surgery? Chair: Marja Boermeester (AMC Amsterdam, Netherlands), Vasileios Komborzos (Athens, Greece) YES. Kamal Itany (SIS-NA, USA) NO. Joe Solomkin (OASIS, USA)</p>
<p>16:00-16:20</p>	<p>Presentation of the Young SIS-E Initiative and SIS-E collaborative study Ines Rubio-Perez (Madrid, Spain) Stijn de Jonge and Sarah Gans, (Amsterdam, Netherlands)</p>
<p>16:20 – 16:30</p>	<p>SIS Asia-Pacific & Japanese Surgical Infection Society report Yuichi Yoshida (Japan)</p>
<p>16:30 – 17:00</p>	<p>Refreshment Break & Poster Round IV</p>
<p>17:00 – 18:45</p>	<p>‘Complex corner’ Educational clinical scenarios in Surgical Infections Interactive session with expert panel Chair: Joerg Schroeder (Cologne, Germany), Dionysios Voros (Athens, Greece)</p> <ul style="list-style-type: none"> • Surgical decisions following radiology findings in acute abdominal infections Nikolaos Economopoulos (Athens, Greece) • How to manage necrotizing fasciitis? Nikolaos Danias (Athens, Greece) • How to manage intestinal fistulas and complex abdomen Marja Boermeester (Amsterdam, Netherlands) • How to manage complex wounds Ibbi Younis (London, UK)
<p>18:45 – 19:45</p>	<p>Use of installation VAC Veraflow™ in complex and infected wounds (Acelity sponsored) Mr. Ibbi Younis (London, UK)</p>

Free paper session I: HBP & abdominal wall

8. Early surgery versus step-up practice for chronic pancreatitis: a multicenter randomized controlled trial

Mr. Rens Kempeneers¹, Dr. Yama Issa¹, Prof. Marco Bruno⁵, Prof. Paul Fockens², Dr. Jan-Werner Poley⁵, Drs. Usama Ahmed Ali⁶, Drs. Thomas Bollen⁸, Prof. Olivier Busch¹, Prof. Cees Dejong¹¹, Dr. Peter van Duijvendijk¹², Dr. H.M. van Dullemen¹⁴, Prof. Casper van Eijck⁴, Prof. Harry van Goor¹⁰, Dr. Muhammed Hadithi¹⁵, Dr. J.W. Haveman¹³, Dr. Yolande Keulemans¹⁶, Dr. Vincent Nieuwenhuijs¹⁷, Dr. Lex Poen¹⁸, Dr. A.C. Tan¹⁹, Dr. W. Thijs²⁰, Dr. Robin Timmer⁷, Prof. Ben Witteman²¹, Prof. Marc Besselink¹, Dr. Jeanin van Hooft², Dr. Hjalmar van Santvoort^{6,9}, Prof. Marcel Dijkgraaf³, Prof. Marja Boermeester¹, for the Dutch Pancreatitis Study Group

¹Dept. of Surgery, Academic Medical Center, Amsterdam, Netherlands, ²Dept. of Gastroenterology, Academic Medical Center, Amsterdam, Netherlands, ³Clinical Research Unit, Academic Medical Center, Amsterdam, Netherlands, ⁴Dept. of Surgery, Erasmus Medical Center, Rotterdam, Netherlands, ⁵Dept. of Gastroenterology, Erasmus Medical Center, Rotterdam, Netherlands, ⁶Dept. of Surgery, St Antonius Hospital, Nieuwegein, Netherlands, ⁷Dept. of Gastroenterology, St Antonius Hospital, Nieuwegein, Netherlands, ⁸Dept. of Radiology, St Antonius Hospital, Nieuwegein, Netherlands, ⁹Dept. of Surgery, University Medical Center Utrecht, Utrecht, Netherlands, ¹⁰Dept. of Surgery, Radboud University Medical Center, Nijmegen, Netherlands, ¹¹Dept. of Surgery, Maastricht University Medical Center+, Maastricht, Netherlands, ¹²Dept. of Surgery, Gelre Hospital, Apeldoorn, Netherlands, ¹³Dept. of Surgery, University Medical Center Groningen, Groningen, Netherlands, ¹⁴Dept. of Gastroenterology, University Medical Center Groningen, Groningen, Netherlands, ¹⁵Dept. of Gastroenterology, Maasstad Hospital, Rotterdam, Netherlands, ¹⁶Dept. of Gastroenterology, Zuyderland Hospital, Sittard/Heerlen, Netherlands, ¹⁷Dept. of Surgery, Isala Hospital, Zwolle, Netherlands, ¹⁸Dept. of Gastroenterology, Isala Hospital, Zwolle, Netherlands, ¹⁹Dept. of Gastroenterology, Canisius-Wilhelmina Hospital, Nijmegen, Netherlands, ²⁰Dept. of Gastroenterology, Martini Hospital, Groningen, Netherlands, ²¹Dept. of Gastroenterology, Gelderse Vallei Hospital, Ede, Netherlands

Background

Surgical intervention for chronic pancreatitis is currently used as last resort treatment when the first steps of the step-up approach, medical and endoscopic treatment have failed. It has been suggested that early surgery may lead to better pain relief and preservation of pancreatic function, as compared to the current step-up approach. We conducted a multicenter randomized controlled trial to compare early surgery with the current step-up approach.

Methods

We included patients with chronic pancreatitis according to the MANNHEIM criteria with a dilated pancreatic duct (≥ 5 mm) and severe continuous or intermittent pain attacks, who had started treatment with opioids just recently. Patients who used strong opioids for more than 2 months or weak opioids for more than 6 months in the last 2 years were excluded. Patients were randomly assigned to early surgery (i.e. 6 weeks after randomization; if pancreatic head <4 cm: lateral pancreaticojejunostomy, if ≥ 4 cm: Frey procedure) or to the step-up approach (step 1: medical treatment, if needed, step 2: endoscopic intervention, if needed, step 3: surgical intervention). The primary endpoint was the mean Izbicki pain score during 18 months of follow-up. Secondary endpoints included pain relief, complications, mortality, number of interventions, pancreatic function, and quality of life.

Results

Eighty-eight patients were randomized, 44 to early surgery (41 indeed underwent surgery) and 44 to the step-up approach (44 underwent medical treatment, 39 endoscopic intervention, and 13 surgical intervention thereafter). Patients in the early surgery group had a lower mean Izbicki pain score during follow-up, as compared to patients in the step-up approach (35 vs. 48, $P=0.018$). Taken into account the baseline pain score, early surgery showed a larger decrease in Izbicki pain score during follow-up (-26 vs. -16 , $P=0.04$). Complete or partial pain relief during



follow-up was achieved in 54% of patients in early surgery and in 33% of patients in the step-up approach (RR: 1.52 [1.40-1.66], $P < 0.001$). Fewer interventions were performed in the early surgery group compared to the step-up group (median 1 vs. 3, $P < 0.001$). Complications, mortality (0%), hospital readmission, pancreatic function and quality of life were comparable between groups.

Conclusions

Early surgery for patients with chronic pancreatitis and a dilated pancreatic duct within the first months of opioid use provides better pain relief with less interventions than the current step-up approach, but quality of life is comparable.

39. Antibiotic use following spillage of bile and gallstones in laparoscopic cholecystectomy

Miss. Aafke Van Dijk¹, Ms Marieke Rutgers¹, Ms Margot van der Hoek¹, Dr. Peter van Duijvendijk², Ms Sandra Donkervoort³, Dr Philip de Reuver⁴, Prof Marja Boermeester¹

¹Academisch Medisch Centrum, Amsterdam, Netherlands, ²Gelre Hospitals, Apeldoorn, Netherlands, ³OLVG, Amsterdam, Netherlands, ⁴Radboud UMC, Nijmegen, Netherlands

Introduction

Laparoscopic cholecystectomy (LC) is the gold standard of treatment in gallstone disease. Accidental perforation of the gallbladder wall during LC is a concern for surgeons, due to the bile and gallstones leaking into the abdominal cavity. Aim of this retrospective study was to assess if antibiotics administered after spill of bile and/or gallstones during laparoscopic cholecystectomy, have an effect on infection-related patient outcomes. Second aim was to assess risk factors for antibiotic use following spill during laparoscopic cholecystectomy.

Methods

Operative reports of all patients undergoing LC between 2012 and 2016 in three hospitals were screened for spill of bile and/or gallstones. Clinical data was collected for each patient. Only patients undergoing LC with spillage of bile and/or gallstones were included in this study. Included patients were categorized in three groups; patients receiving prophylactic antibiotics just before start of surgery, patients that received a dose of antibiotics during surgery because of spill of bile and/or gallstones and patients without antibiotics in the perioperative period.

To compare groups, Chi-square or Kruskal-Wallis H test was used. Multivariate logistic regression was used to assess independent risk factors for antibiotics during LC after spillage of bile during LC.

Results

Operative reports of a total of 3262 procedures were checked and in 481 an accidental perforation of the gallbladder, with spillage of bile and/or gallstones (14.7%), was reported. Of these 481 patients, 118 received prophylactic antibiotics preoperatively only (24.5%) and 107 patients received a single dose of antibiotic after spill during LC (22.2%). The remaining 256 patients did not receive antibiotics pre- or intraoperatively (53.2%).

No significant difference in the rate of infectious complications was found between patients receiving antibiotics (either prophylactic or during surgery) or no antibiotics.

Both a presentation with acute cholecystitis and spillage of pus were independent riskfactors for a dose of antibiotics after spill during LC. Age at surgery, female gender, ASA classification of 3 or 4, history of diabetes, history of complicated disease, infected aspect of the gallbladder and spill of stones were all not significantly associated with a dose of antibiotics following spill in LC.

Conclusion

In patients undergoing laparoscopic cholecystectomy with spillage of bile and/or gallstones, antibiotics, either prophylactic or intraoperatively after spill, do not reduce the rate of complications compared to patients undergoing laparoscopic cholecystectomy with spillage of bile and/or gallstones who did not receive antibiotics. Antibiotics therefore do not seem necessary in the intraoperative management of spill of bile and/or gallstones during LC.

47. Evaluating eosinopenia and Neutrophil-to-Lymphocyte Ratio as outcome markers in patients undergoing cholecystostomy for acute cholecystitis classified by 2018 Tokyo Guidelines

Ms. Begoña Peinado Iribar¹, Ms. Estibaliz Álvarez Peña¹, Ms. Arantxa Villadóniga Sanchez¹, Mr. Luis Asensio Gómez¹, Dr. Jose Tomás Castell Gómez¹, Dr. Jose Luis Marijuan¹, Prof. Joaquín Díaz Domínguez¹, Prof. Inés Rubio Pérez¹

¹Hospital Universitario La Paz, Madrid, Spain

Cholecystitis continues to be one of the most common conditions in the Emergency surgical setting. Decision-making tools for the selection of patients that must undergo emergency surgery include the Tokyo Guidelines, recently updated this year. Other treatment options such as cholecystostomy, condition reevaluation to confirm sepsis is controlled and avoid negative outcomes. Analytic variables or markers that could predict an adequate response after cholecystostomy would be of a high clinical value. Various studies have proved that leucocytosis combined with a low eosinophil count are strongly related to bacterial infections, with a practical use in the clinical setting, even for ICU patients.

The aim of this study was to evaluate the application of 2018 Tokyo Guideline algorithms in the selection of patients that undergo cholecystostomy in our tertiary care hospital and evaluate if eosinopenia and Neutrophil-to-Lymphocyte Ratio (NLR), measured upon admission and on the 3rd day, could be useful markers to predict outcomes. We performed a retrospective study of 403 patients admitted with acute cholecystitis in 2 years (variables had been recorded prospectively). There were 67 patients in which a percutaneous cholecystostomy was performed. Their mean age was 77 years, 58.2% male. Mean time from presentation of symptoms to emergency consultation was 3.12 days, 34% were diabetic and 11.9% had immune suppression. We also evaluated comorbidities by calculating Charlson Index: 60% had an index ≥ 3 (maximum value 11), in 12% the index value was 0. Acute cholecystitis classification following 2018 Tokyo Guidelines was: 20.8% Grade I, 46.2% Grade II and 32.8% Grade III. If both factors were taken into account: 58% of the patients had a Charlson index ≥ 3 and an acute cholecystitis Grade II or III. Regarding SOFA score, 44 patients (66%) presented values between 1 and 6 upon admission. On the 3rd day, NLR presented an increase in its initial value in 18 patients (27%), and we registered persistent eosinopenia in 12 patients (18%) (which was absolute in 50%). Both coexisted in 8 patients (12%). Related data for each parameter are shown in the Table.

Variable	Increased NLR on 3 rd day	Eosinopenia on 3 rd day
Number of patients	18	12
Mean age (years)	77.3	76
Gender	Male 55%	Male 50%
Diabetes	44%	58%
Charlson index ≥ 3	50%	50%
Mean time from symptoms to diagnosis	2.34 days	1.58 days
TG II-III	66%	100%
Clinical worsening	61%	83%
Need for surgical intervention	27%	25%

Mean hospitalization (days)	18	17
Exitus (n)	2	2

Conclusions

As recommended by the updated 2018 Tokyo Guidelines, the selection of treatment for acute cholecystitis is conditioned by severity, patient's general status and underlying diseases. In our institution, most patients undergoing cholecystostomy were grade II or III, following clinical guidelines. Another indication was very co-morbid patients with high Charlson index and therefore high surgical risk. Some patients with persistent eosinopenia and increased NLR after 3 days presented clinical worsening (83% and 61% respectively), so these parameters could aid in evaluation of clinical response after drainage.

9. Efficacy of total pancreatectomy with islet autotransplantation on morphine and insulin requirement in chronic pancreatitis: a systematic review and meta-analysis

Mr. Rens Kempeneers^{1*}, Drs. L. Scholten^{1*}, Ms. C.R. Verkade¹, Dr. J.E. van Hooft², Dr. H.C. van Santvoort³, Prof. O.R. Busch¹, Prof. J.H. de Vries⁴, Prof. M.G. Besselink^{1#}, Prof. M.A. Boermeester^{1#}, for the Dutch Pancreatitis Study Group
¹*Dept. of Surgery, Academic Medical Center, Amsterdam, Netherlands*, ²*Dept. of Gastroenterology, Academic Medical Center, Amsterdam, Netherlands*, ³*Dept. of Surgery, St Antonius Hospital, Nieuwegein, Netherlands*, ⁴*Dept. of Endocrinology, Academic Medical Center, Amsterdam, Netherlands*

*contributed equally, #Share senior authorship

Keywords: islet auto transplantation, insulin independent, morphine independent

Background: The rationale for total pancreatectomy in refractory chronic pancreatitis is pain control. In addition, islet cell autotransplantation (TP-IAT) may be added to mitigate loss of islet cell function. TP-IAT may be less effective after previous endoscopic or surgical therapy.

Methods: Cochrane Library, Pubmed and Embase were systematically searched from January 1990 until February 2017. Three independent reviewers screened studies for eligibility. Included were studies evaluating TP-IAT for chronic pancreatitis in adults. For the outcomes morphine-free and insulin-free rates and mortality, random effects meta-analysis and meta-regression analysis were conducted.

Results: We included 17 observational studies evaluating 1,325 patients of whom 50-100% had previous endoscopic and 28% previous surgical therapy. At 1-year follow-up, the morphine-free rate was 61% (95%CI: 41%-68%) and the insulin-free rate was 17% (95%CI: 14%-21%). Quality of life was significantly improved after TP-IAT in all studies. Rates of 30-day and 1-year mortality were 2% (95%CI: 1%-4%) and 4% (95%CI: 3%-6%), respectively. Publication bias seemed present in both morphine and insulin outcomes. Previous surgical therapy was shown not to be a negative factor for morphine- and insulin-free rates.

Conclusion: TP-IAT in selected patients with refractory chronic pancreatitis results in a morphine-free rate of 61% and an insulin-free rate of 17% at 1-year follow-up. Further research should focus on indication and timing of TP-IAT in chronic pancreatitis, especially in comparison to the timing of surgical drainage procedures.

40. A systematic review of the pressure-induced vasodilation phenomenon and its role in the pathophysiology of ulcers

Mr. Pieter Zwanenburg¹, Ms Sophia Backer¹, Dr. Oren Lapid¹, Dr. Miryam Obdeijn¹, Prof. dr. Marja Boermeester¹
¹*Academic Medical Center, Amsterdam, Netherlands*

Background

Physiological studies demonstrate that a moderate amount of pressure, as in exertion of a compressive mechanical force onto tissue, increases local blood flow through a vasodilatory axon reflex, referred to as “pressure-induced vasodilation” (PIV). Although PIV protects against pressure-induced lesions such as pressure ulcers and diabetic foot ulcerations, this phenomenon is currently not appreciated in the literature. In order to provide the scientific community with a comprehensive synopsis of PIV, the goal of this article is to systematically review all that is known about PIV.

Methods

Two independent reviewers performed a systematic search of literature published before 2018 in PubMed, Embase and CENTRAL in order to identify all eligible articles concerning PIV.

Results

Eighteen animal studies, ten human studies, and one study investigating both animal and human populations were included in this review. All studies demonstrated that a moderate amount of pressure increased local blood flow, with a maximum peak flow during pressure-induced vasodilation of +62% (\pm 4%), compared to baseline in human subjects with healthy neurovascular status. In an animal study investigating the physiology behind PIV, low level pressures induced a peak flow of +41% (\pm 3%) in control mice, whereas an increase of local blood flow never occurred in mice with knockout of acid-sensing ion channel 3 (ASIC3), the mechanosensor initiating the vasodilatory PIV cascade. Likewise, PIV did not occur in humans treated with ASIC3-antagonists such as Diclofenac, whereas humans receiving placebo displayed a peak flow of +62% (\pm 4%). After four hours of skin compression with evaluation of ischemic lesions after twenty-four hours, 100% of *Asic3*^{-/-} mice developed ischemic lesions, whereas 60% of *Asic3*^{+/+} mice did. Moreover, the cutaneous area with a loss of perfusion was smaller in *Asic3*^{+/+} mice (33 ± 14 mm²) than in *Asic3*^{-/-} mice (144 ± 26 mm², $P < 0.01$), corresponding to $19 \pm 8\%$ and $81 \pm 15\%$ ($P < 0.01$) of the total compressed area. Human subjects with peripheral neuropathy did not display PIV, leading to early pressure-induced cutaneous ischemia ($-31 \pm 10\%$, $P < 0.001$).

Conclusion

PIV serves to protect against pressure-induced lesions by increased blood flow thereby preventing ischemia. PIV impairment provides a coherent explanation of why neuropathic tissues are so evidently susceptible to pressure-induced lesions. PIV provides a physiological basis for interventions aimed at prevention of exposure to pressures such as offloading, which despite infrequent clinical deployment have been shown to be effective in systematic reviews and meta-analyses. Individuals at risk of pressure-induced lesions may benefit from refraining from PIV-interfering drugs such as Diclofenac.

41. Incisional Negative Pressure Wound Therapy for prevention of postoperative wound complications - A systematic review and meta-analysis

Mr. Pieter Zwanenburg¹, Mr. Berend Tol¹, Dr. Oren Lapid¹, Dr. Miryam Obdeijn¹, Prof. dr. Marja Boermeester¹
¹*Academic Medical Center, Amsterdam, Netherlands*

Background

Negative Pressure Wound Therapy (NPWT) is increasingly applied on primarily closed surgical wounds and has been suggested by the World Health Organization for the prevention of surgical site infection. For the WHO recommendation available evidence between 1990 and 10-2015 was systematically reviewed. An up-to-date review appears warranted, since thereafter many other trails have been published.

Methods

PubMed, Embase and CENTRAL were systematically reviewed by two independent reviewers in order to identify all studies published before 2018 investigating the influence of incisional negative pressure wound therapy (iNPWT) on the incidence of postoperative wound complications. Included were randomized controlled trials and observational studies comparing iNPWT with conventional wound dressings and reporting on the incidence postoperative wound complications. Meta-analyses were performed with a random effect model for RCTs and observational studies separately. GRADE Pro software was used to qualify the evidence.

Results

The resulting studies are presented in this review. Summary estimates show a significant benefit of iNPWT over conventional wound dressings in reducing SSI, wound dehiscence, seroma and hematoma, in both randomized controlled trials and observational studies. In stratified analyses, these results are consistent in both clean and potentially contaminated procedures and different types of surgery.

Conclusion

An updated systematic review of available evidence shows that the WHO recommendation suggesting the use of iNPWT for the prevention of postoperative wound surgical site infection is still valid. Moreover, iNPWT can be used to prevent other postoperative wound complications such as wound dehiscence, skin necrosis, seroma and hematoma as well.

25. Comparison between biologic mesh and current management of the open abdomen in non-trauma emergency patients

Mr. Jeroen Claessen¹, Dr. Fleur de Vries¹, Dr. Jasper Atema¹, Dr. Oddeke van Ruler², Prof. Marja Boermeester¹
¹Academic Medical Centre Amsterdam, Amsterdam, Netherlands, ²IJsselland Ziekenhuis, Capelle aan den IJssel, Netherlands

Introduction

In approximately 10% of emergency laparotomies in non-trauma patients primary fascial closure is not possible due to excessive visceral edema, which leaves the patient with an open abdomen (OA). An OA harbors an inherent high risk of serious complications. A potential and relatively new strategy in the management of an OA is direct closure with a non-crosslinked biologic mesh in the emergency setting.

Methods

We performed a prospective comparative cohort study of non-trauma patients who underwent an emergency laparotomy where primary fascial closure of the abdomen was not possible due to excessive visceral edema (CLOSE-UP study). One cohort, BIOMESH, was treated by direct closure of the abdominal cavity with Strattice™, a non-crosslinked biological mesh. A second, parallel cohort, CONTROL, comprised patients where the open abdomen was managed according to current surgical practice: either by covering it with an inlay polyglactin (Vicryl®) mesh or using ABThera™ negative pressure therapy. The primary endpoint was the occurrence of a major complication within 90 days. Secondary endpoints were the proportion of closed abdominal cavities, hospital stay, intensive care unit (ICU) stay, duration of mechanical ventilation, and the number of abdominal reoperations and radiological interventions within 90 days.

Results

In all 20 patients of the BIOMESH cohort it was possible to close the abdominal cavity during index surgery. In 55% of these patients the fascia was closed by reinforcement and in 45% a bridging mesh was used. In the CONTROL cohort none of the abdominal cavities were closed during index surgery. After open abdomen management (delayed) fascial closure was achieved during initial treatment in 45% of the patients. In the BIOMESH cohort 35% of patient had at least one major complication vs. 75% in the CONTROL cohort ($P=0.011$). After 90 days, 65% (13/20) of the abdominal cavities in the STRATTICE cohort were closed compared to 45% (9/20) in the CONTROL cohort ($P=0.204$). The median number of ICU and mechanical ventilation days were both significantly lower in the BIOMESH cohort (1 vs 10 ($P = 0.002$) and 0 vs. 4 days ($P = 0.003$), respectively). The median number of abdominal re-operations was significantly lower in the BIOMESH cohort (0 versus 2, $P < 0.001$); 44 abdominal re-operations in the CONTROL group vs. 5 re-operations in the BIOMESH cohort.

Conclusion - In non-trauma patients in whom primary fascial closure is not possible after an emergency laparotomy, a non-crosslinked biologic mesh more frequently results in a closed abdomen than current practice and is associated with significantly less complications and ICU days.

24. Long-term outcomes after contaminated complex abdominal wall reconstruction

Mr. Jeroen Claessen¹, Dr. Fleur de Vries¹, Mr. Jonathan Hodgkinson², Dr. Oddeke van Ruler³, Ms. Carolynne Vaizey², Prof Marja Boermeester¹

¹Academic Medical Centre Amsterdam, Amsterdam, Netherlands, ²St. Mark's Hospital, London, United Kingdom, ³IJsselland Ziekenhuis, Capelle aan den IJssel, Netherlands

Introduction

Complex abdominal wall repair (CAWR) in a potentially contaminated operative field is a challenge. Sparse literature regarding long-term outcomes is available.

Objective

This study aimed to assess long-term outcomes of modified VHWG grade 3 repairs. Because the relevance of clinical hernia recurrence as the primary outcome for this complex and specific patient group is contentious, the need for further hernia surgery was also assessed in relation to long-term survival.

Methods

This was retrospective cohort study with a single prospective follow-up time-point nested in a consecutive series of patients undergoing CAWR in two European national intestinal failure centers.

Results

266 modified VHWG grade 3 procedures in 248 patients were included in analysis. The overall long-term hernia recurrence rate was 32.3%. The hernia recurrence rates for biologic and synthetic meshes were 20.3% and 30.6%, respectively, when fascial closure was achieved, while the rates of further hernia surgery were 7.2% and 16.7%. Overall survival was relatively good with 80% and 70% of the patients still alive after 5 and 10 years, respectively. When fascial closure was achieved the need for further hernia surgery occurred in the first 3 years. In total 86.6% of the patients remained free of further hernia surgery.

Conclusions

Bridged repairs should be avoided whenever possible. Non-crosslinked biologic mesh shows better results than synthetic mesh in contaminated CAWR. As overall survival was good and the majority of patients remained free of additional hernia surgery at 10-year follow-up, the initial higher costs of a biologic mesh seem trivial.

Free Paper Session II: Colorectal & appendix

35. Interobserver variability in the classification of appendicitis during laparoscopy

Miss. Anne Loes van den Boom¹, Miss. Elisabeth de Wijkerslooth¹, Miss. Katya Mauff¹, Dr. Imro Dawson², Dr. Charles van Rossem³, Dr. Boudewijn Toorenvliet⁴, Dr. Bas Wijnhoven¹

¹*Erasmus MC Rotterdam, Rotterdam, Netherlands*, ²*IJsselland Ziekenhuis, Capelle a/d IJssel, Netherlands*, ³*Maasstad Ziekenhuis, Rotterdam, Netherlands*, ⁴*Ikazia Ziekenhuis, Rotterdam, Netherlands*

Background

The intraoperative classification of appendicitis dictates the patient's postoperative management: prolonged antibiotic prophylaxis is recommended for complex appendicitis (gangrenous, perforated, abscess), whilst preoperative prophylaxis suffices for simple appendicitis. Distinguishing these two conditions can be challenging. The aim of this study was to assess the interobserver variability in the classification of appendicitis during laparoscopy.

Methods

Short video-recordings taken during laparoscopy for suspected appendicitis were shown to surgeons and surgical residents. They were to 1) classify the appendix as no, simple or complex appendicitis, 2) categorize it as normal, phlegmonous, gangrenous, perforated and/or abscess, and 3) decide whether they would prescribe postoperative antibiotics. Answers to the second question were recategorised into complex appendicitis and not complex appendicitis according to the definition by Bhangu *et al.* (Lancet 2015). Interrater reliability was evaluated using Fleiss' kappa (K) score and the S* statistic.

Results

Eighty assessors participated in the study. Video-recordings of twenty patients were used. Interobserver agreement was minimal for both the classification of appendicitis (K 0.398, 95% CI 0.385 – 0.410) and the choice for postoperative antibiotic treatment (K 0.378, 95% CI 0.362 – 0.393). Agreement was slightly higher when Bhangu's definition of complex appendicitis was applied (K 0.552, 95% CI 0.537 – 0.568).

Conclusion

The present study indicates that there is considerable variability in the intraoperative classification of appendicitis and the decision to prescribe postoperative antibiotic treatment.

49. Is eosinophil count a useful marker in acute appendicitis and can it predict pathological findings?

Dr. Luis Asensio-Gómez¹, Dr. Ines Rubio-Perez¹, Dr. Arantxa Villadoniga¹, Dr. Pedro Ramos¹, Dr. Begoña Peinado¹, Dr. Estibaliz Álvarez-Peña¹, Dr. Joaquin Diaz Dominguez¹

¹*Hospital Universitario La Paz, Madrid, Spain*

Eosinopenia has been defined in human and animal models as a marker of bacterial infection. The response to acute inflammation involves a rapid and persistent decrease in the numbers of circulating eosinophils, however the exact mechanisms have not been clearly established. Theoretically, it could result from the release of chemotactic factors of acute inflammation into the circulation. If the host's response to infection is adequate, eosinophil count is soon normalized. This has also been used in septic patients as a marker of response to antibiotic treatment. In acute appendicitis, scores such as Alvarado and analytic results can orient severity of the condition, but the clinical diagnosis of appendicitis in the Emergency Department is nowadays confirmed by imaging. However, in many cases there might be a discordance between radiologic reports and intraoperative findings, especially if ultrasound is performed. In this context, any additional marker that could be a predictor of a more advanced state of appendicitis could be useful. We speculated if the eosinophil count could be a helpful tool as a predictor of operative or anatomopathological findings regarding phlegmonous or gangrenous appendicitis.

We reviewed a cohort of 130 consecutive patients with appendicitis in which data had been recorded prospectively in 2016. We reviewed initial CRP, eosinophil count, Neutrophil to Lymphocyte Ratio (NLR) and divided the cohort in 2 groups after the final pathological diagnosis: 1) phlegmonous/uncomplicated appendicitis and 2) gangrenous appendicitis. Eosinopenia was defined as absolute values of $<0.02 \times 10^3/\mu\text{L}$ and differential values of $<0.5\%$.

Appendectomy was performed in 130 patients (66 female). There were 3 cases of pathologically normal appendix, excluded from analysis. Group 1 (non-complicated appendicitis) included 72 patients, mean age 32 years, mean Alvarado score 5.6, days of symptoms (mean) 1.3, NLR (mean) 7.8, CRP (mean) 40 mg/L, mean eosinophil count $0,089 \times 10^3/\mu\text{L}$ and 0,81%. There were 55 patients in group 2 (gangrenous appendicitis) mean age 45 years, mean Alvarado score 5.8, days of symptoms (mean) 2.1, NLR (mean) 11, CRP (mean) 99 mg/L, mean eosinophil count $0,083 \times 10^3/\mu\text{L}$ and 0,65%.

When comparing these values between groups we found CRP values ($p < 0,0001$ T-test) and NLR values ($p < 0,015$ T-test) were significantly higher in gangrenous appendicitis compared to phlegmonous appendicitis. Eosinopenia was found in 70 (54%) of all patients with appendicitis. However, there were no significant differences in mean values between groups.

Eosinopenia may be useful together with other analytic results in differentiating appendicitis from other non-infectious conditions, as suggested in the literature. Although limited by the small cohort number, our study suggests eosinopenia doesn't seem to be powerful enough to differentiate between uncomplicated and gangrenous appendicitis. For this purpose, CRP and NLR continue to be most reliable markers. Further studies would be needed to assess the real value of eosinopenia in acute surgical conditions.

42. Timing for appendectomy; is longer time to surgery associated with more complications in patients with complicated appendicitis?

Mr. Wouter Bom¹, Ms. Joske de Jonge³, Mr. Matthijs Bolmers³, Dr. Sara Gans¹, Prof. Marja Boermeester¹, dr. Nanette van Geloven³, prof. Willem Bemelman¹, Dr. Charles van Rossem²

¹AMC, Amsterdam, The Netherlands, ²Maastad Ziekenhuis, Rotterdam, The Netherlands, ³Tergooi, Hilversum, The Netherlands

Introduction

It is a longtime believe that an uncomplicated appendicitis can become a complicated (e.g., perforated) appendicitis when time passes. Recent studies suggest that this may not be true, and that complicated appendicitis and uncomplicated appendicitis are two different entities.

Current diagnostic strategies have insufficient discriminatory value in distinguishing between uncomplicated and complicated appendicitis; this still leans on the clinical appraisal of the physician on the emergency room. In the new Dutch guidelines for emergency surgery, appendectomy within 8 hours is recommended in patients with a complicated appendicitis, whereas for uncomplicated appendicitis delay of surgery up to 24 to 48 hours is accepted. However, this particular recommendation is in need of more prospective data.

Aim

To determine whether a longer time interval between presentation at the emergency department and appendectomy in patients with complicated appendicitis is associated with more complications.

Methods

In this study we used the data from the prospective 'Snapshot Appendicitis Collaborative Study Group'. A total 1975 patients who underwent surgery for suspected acute appendicitis in 62 Dutch hospitals were included in this prospective observational audit. They were included in only 2-3 months' time. For present analysis we excluded children (<18 years). The definition of complicated appendicitis was based on the intraoperative findings described in the surgical reports. Mann-Whitney U tests and chi-square tests were used to determine significance.

Result

1434 adult patients were included in this analysis, 947 patients (66%) with an uncomplicated appendicitis and 487 patients who were judged to have a complicated appendicitis. Median time between arrival on the emergency department and start of surgery (time to surgery) was 7.1 hours for both uncomplicated and complicated appendicitis groups ($p=0.51$). About half of the patients in each group underwent appendectomy within 8 hours 54.1% (257/475) with a complicated appendicitis versus 56.9% (531/934) with an uncomplicated appendicitis; $p=0.326$.

Complications after appendectomy were seen in 190 of 1434 patients (13.2%); 8.3% (79/947) after an uncomplicated appendicitis versus 22.8% (111/487) after a complicated appendicitis ($p<0.001$). For all patients operated within 8 hours, complications were seen in 7.5% (40/491) of patients with an uncomplicated appendicitis versus 9.4% (38/365) with a complicated appendicitis ($p=0.30$). Among patients with a complicated appendicitis, 18.3% (47/210) of patients developed a complication if surgery was performed within 8 hours versus 27.5% (60/158) when surgery was performed after more than 8 hours ($p=0.016$).

Conclusion

Patients with complicated appendicitis are at higher risk for complications after appendectomy if surgery is performed more than 8 hours after arrival at the emergency department.

20. Natural course of small pericolic or mesocolic diverticular abscesses compared to uncomplicated acute diverticulitis.

Mr. Stefan T van Dijk¹, Ms. Kelly Bos¹, Ms. Hendrike E Bolkenstein², Dr. Çağdas Ünlü³, Prof. Marcel GW Dijkgraaf⁴, Dr. Anna AW van Geloven⁵, Prof. Marja A Boermeester¹

¹Department of Surgery, Academic Medical Center, Amsterdam, Netherlands, ²Department of Surgery, Meander Medical Center, Amersfoort, Netherlands, ³Department of Surgery, Medical Center Alkmaar, Alkmaar, Netherlands, ⁴Clinical Research Unit, Academic Medical Center, Amsterdam, Netherlands, ⁵Department of Surgery, Tergooi Hospital, Hilversum, Netherlands

Background

Pericolic diverticular abscesses are generally considered complicated diverticulitis and abscesses larger than 5 centimetres are percutaneously drained. However, these practices are mostly based on technical feasibility and assumptions about the natural course rather than clinical patients' outcomes. This study aimed to assess whether the natural course of patients with a small diverticular abscess is more virulent than uncomplicated diverticulitis patients and to correlate the size of an abscess with rates of complications and interventions.

Methods

Computed tomography proven, left-sided acute diverticulitis patients from three patient cohorts (one randomised clinical trial and two observational cohorts) including 129 patients with a pericolic or mesocolic abscess up to 5 centimetres and 1547 uncomplicated diverticulitis patients were combined. First, all abscess patients (< 5 cm) were compared to uncomplicated diverticulitis patients. Second, patients with an abscess smaller than 3 centimetres were compared to uncomplicated diverticulitis patients. Outcomes were length of hospital stay and rates of complicated diverticulitis, percutaneous abscess drainage and surgery. Short-term outcome rates (within 90 days) were compared among groups, long-term (at end of follow-up) were analysed using cox regression models.

Results

The disease course in patients with an abscess up to 5 centimetres was more virulent compared to uncomplicated patients on both short-term (complicated diverticulitis 14.0% (18/129) versus 5.2% (80/1547), $p < 0.001$; percutaneous abscess drainage 3.9% (5/129) versus 0.2% (3/1547), $p < 0.001$; and sigmoid resection 14.0% (18/129) versus 6.7% (103/1547), $p = 0.002$, respectively) and long-term. However, when only patients with an abscess smaller than 3 centimetres were compared with uncomplicated patients, no differences were found on both short-term (complicated diverticulitis 6.3% (3/48) versus 5.2% (80/1547), $p = 0.736$; percutaneous abscess drainage 2.1% (1/48) versus 0.2% (3/1547), $p = 0.115$; and sigmoid resection 8.3% (4/48) versus 6.7% (103/1547), $p = 0.559$; in abscess patients and uncomplicated patients respectively) and long-term (complicated diverticulitis hazard ratio (HR) 1.06 (95% CI 0.39-2.91), sigmoid resection HR 0.72 (95% CI 0.32-1.64) and recurrent diverticulitis HR 1.24 (95% CI 0.58-2.65) for abscess patients compared to uncomplicated patients). Additionally, omitting antibiotics in abscess patients did not increase rates of adverse events.

Conclusion

Patients with acute diverticulitis and a pericolic or mesocolic abscess up to 5 centimetres suffered from a significantly more virulent disease course compared to patients with uncomplicated acute diverticulitis. Patients with an abscess smaller than 3 centimetres, however, did not differ from uncomplicated patients and may therefore be treated conservatively and as outpatients. Larger abscesses may need percutaneous abscess drainage. The cut-off value of 3 centimetres to differentiate between small and large abscesses seems useful for treatment choice.

13. A systematic review of colonoscopy after an episode of left-sided acute diverticulitis.

Mrs. S.J. Rottier^{1,2,3}, Mr. S.T. van Dijk¹, Dr. A.A.W. van Geloven³, Dr. W.H. Schreurs², Dr. W.A. Draaisma¹, Dr. W.A. van Enst⁴, Dr. J.B.C.M. Puylaert⁵, Dr. M.G.J. de Boer⁶, Dr. B.R. Klarenbeek⁷, Dr. J.A. Otte⁸, Dr. R.J.F. Felt⁹, Prof. M.A. Boermeester¹

¹Department of Surgery, Academic Medical Center, Amsterdam, the Netherlands, ²Department of Surgery, Northwest Clinics, Alkmaar, the Netherlands, ³Department of Surgery, Tergooi Hospital, Hilversum, the Netherlands, ⁴Knowledge Institute of Medical Specialists, Utrecht, the Netherlands, ⁵Department of Radiology, Haaglanden Medical Center, The Hague, the Netherlands, ⁶Department of Infectious Diseases, Leiden University Medical Center, Leiden, the Netherlands, ⁷Department of Surgery, Radboud University Medical Center, Nijmegen, the Netherlands, ⁸Department of Internal Medicine, ZorgSaam Hospital, Terneuzen, the Netherlands, ⁹Department of Gastroenterology, VU University Medical Center, Amsterdam, the Netherlands

Background

Most guidelines recommend routine colonoscopy after an episode of acute diverticulitis to exclude an underlying malignancy. However, studies assessing the risk of colorectal carcinoma (CRC) and advanced colorectal neoplasia (ACN) in these patients are contradictory. This systematic review aimed to estimate the prevalence of CRC and ACN in acute diverticulitis patients and therefore to assess the role of colonoscopy after acute diverticulitis.

Methods

PubMed and EMBASE were searched for studies reporting rates of ACN or CRC in patients that underwent colonoscopy within one year after an episode of computed tomography proven (CT) and left-sided acute diverticulitis. Rates were pooled using a random effects model and, when reported by studies, compared with groups of asymptomatic controls.

Results

A total of 16 studies, with 3196 patients, was included. The pooled prevalence of ACN was 6.9% (95% CI 5.0%-9.4%) and that of CRC 2.2% (95% CI 1.5%-3.2%). Comparison with asymptomatic controls was reported by only 2 studies, yielding comparable risks (RR 1.80, 95% CI 0.66-4.96; for diverticulitis compared to controls, respectively). Subgroup analysis of uncomplicated acute diverticulitis patients showed a 5.2% (95% CI 3.5%-7.6%) prevalence of ACN and a 0.5% (95% CI 0.2%-1.2%) prevalence of CRC.

Conclusion

Straight comparisons of ACN and CRC prevalence between diverticulitis patients and asymptomatic controls are not sufficiently reported to draw conclusions. Although the rate of ACN in CT-proven diverticulitis patients (6.9%) is comparable to reported rates in asymptomatic controls from literature (3.8% to 10.3%), the CRC rate in diverticulitis patients (2.2%) is slightly higher (0.5% to 1.0% in controls). However, uncomplicated diverticulitis patients show comparable CRC rates (0.5%) to asymptomatic controls. Therefore, routine colonoscopy in complicated diverticulitis patients seems appropriate, whereas a colonoscopy in uncomplicated diverticulitis patients may be omitted.

48. WSES sepsis severity score for patients with peritonitis: is it applicable and useful for residents in the Emergency Department?

Dr. Luis Asensio-Gómez¹, Dr. Arantxa Villadóniga¹, Dr. Begoña Peinado¹, Dr. Estibaliz Álvarez Peña¹, Dr. Jose Luis Marijuan¹, Dr. Joaquin Díaz Dominguez¹, Dr. Ines Rubio-Perez¹
¹*Hospital Universitario La Paz, Madrid, Spain*

The World Society of Emergency Surgery (WSES) recently validated in a multicentre international study the 'WSES sepsis severity score' for patients with complicated intra-abdominal infections. The score pretended to be a practical tool to predict patient mortality specifically in surgical patients, considering both clinical and surgical variables. The concept of a specific score for surgical patients is attractive, as some other scores for early detection of sepsis-related mortality (such as SIRS or qSOFA) have failed in early detection of severity in abdominal infections. The variables selected for the score from a multivariate analysis were: presence of sepsis/shock upon admission, setting of acquisition of infection, origin of the peritonitis, delay in source control and 2 patient's risk factors (age and immunosuppression), with total scoring points ranging from 0-18. After ROC analysis the optimum cut-off point published was 5.5 for the highest sensitivity and specificity values.

With this new tool available in the surgical setting, we decided to perform a prospective study analysing if the validated results were applicable in our tertiary care university hospital. We also considered if the score was easy to use by residents and if there were any issues regarding an adequate understanding and scoring. A total of 162 patients admitted to our surgical Emergency Department that underwent surgery with diagnosis of peritonitis were scored. Mean age was 51,86 years, 55,5% male. The most common site of perforation was appendix. Only 44.7% of patients presented >2 SIRS criteria and 26.9% >2 qSOFA criteria upon admission. Most patients presented WSES scores between 2 and 5 points.

Mortality rate in our series was 11%. When analysing specifically the 18 patients that died, the WSES mode was 8-9 points, and the most common location of perforation was the colon (12 patients). There were only 2 deceased patients with low WSES scores upon admission (2 and 3 points), one a 93 y.o patient with perforated appendicitis and another a 60 y.o male with perforated peptic ulcer, that developed complications leading to mortality in the late postoperative period.

We analysed sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of the score for 2 possible cut-off points, >5 and ≥6, as shown in the Table.

cut-off	Nº of patients	deceased patients	sensitivity	specificity	PPV	NPV
>5	145	16	0.889	0.978	0.972	0.889
≥6	145	16	0.889	0.978	0.972	0.889

The sensitivity for WSES was very high compared to other scores, and our data are consistent with those published by the WSES group. The score was considered easy to use and useful for the Emergency setting. Queries raised during scoring by residents and trainees included adequate classification of peritonitis from biliary tree or gastric ulcer (included in small bowel category?) or appendicular (included as non-diverticular colonic perforation?), when to record the parameters of severe sepsis (upon admission or immediately pre-surgery) and how to consider >24 peritonitis (if upon admission or in re-operation patients only)

19. Individual patient data meta-analysis of observational versus antibiotic treatment of uncomplicated acute diverticulitis.

Mr. Stefan T van Dijk¹, Dr. Abbas Chabok², Prof. Marcel GW Dijkgraaf³, Dr. Anna AW van Geloven⁴, Prof. Marja A Boermeester¹, Dr. Kenneth Smedh²

¹*Department of Surgery, Academic Medical Center, Amsterdam, Netherlands,* ²*Department of Surgery, Västmanlands Hospital, Västerås, Sweden,* ³*Clinical Research Unit, Academic Medical Center, Amsterdam, Netherlands,*

⁴*Department of Surgery, Tergooi Hospital, Hilversum, Netherlands*

Background

Two randomized clinical trials (AVOD and DIABOLO) showed no difference in recovery or adverse outcomes when omitting antibiotics for uncomplicated acute diverticulitis compared to routine antibiotic treatment. Both trials however showed some – by enlarge statistically non-significant but possibly clinically relevant – higher rates of complicated diverticulitis and sigmoid resection. Since the trials lacked statistical power to detect differences in secondary outcomes, a meta-analysis of individual patient data may provide more firm conclusions and identify patient subgroups – if any – that may benefit from antibiotic treatment.

Methods

Individual patient data of uncomplicated diverticulitis patients from two randomized clinical trials (AVOD and DIABOLO) comparing observational and antibiotic treatment were pooled; 545 patients in the observational group and 564 patients in the antibiotic group. Study groups were compared using generalized linear mixed model with adjustment for clustering of data. Furthermore, risk factors for adverse outcomes and the effect of observational treatment on the risk of adverse outcomes were assessed using logistic regression analyses. A $p < 0.025$ was considered statically significant due to multiple testing adjustment.

Results

No statistical differences were found in 1-year follow-up rates of ongoing diverticulitis (observational 7.2% versus antibiotics 5.0%; $p = 0.062$), recurrent diverticulitis (observational 8.6% versus antibiotics 9.6%; $p = 0.610$), complicated diverticulitis (observational 4.0% versus antibiotics 2.1%; $p = 0.079$) and sigmoid resection (observational 5.0% versus antibiotics 2.5%; $p = 0.214$). If one may consider the absolute differences in complicated diverticulitis and sigmoid resection rates clinically relevant however, the sample size of the present meta-analysis was insufficient to detect such small differences. A pain score on a visual analogue scale higher than 7, white blood cell counts higher than $13.5 \times 10^9/L$ and a history of acute diverticulitis at presentation were risk factors for adverse outcomes. Among other factors, age and body temperature or c-reactive protein at presentation were no risk factors. Moreover, observational treatment did not increase the risk of adverse outcome in high-risk patients.

Conclusion

Omitting antibiotics in the treatment of uncomplicated acute diverticulitis showed comparable rates of adverse events up to 1-year follow-up compared to antibiotic treatment but some statistical uncertainty may remain depending on thresholds of clinical relevance. When encountered drawbacks of antibiotics, mainly antibiotic-related morbidity including allergic reactions and rising antimicrobial resistance are considered as well, selective use of antibiotics only in those at high-risk for adverse outcome may be a useful strategy.

34. Preventative measures for surgical site infection in elective colorectal surgery. A survey among Spanish colorectal surgeons.

Dr. Nares Arroyo-García¹, Dr Inés Rubio-Pérez², Prof José M Balibrea del Castillo³, Dr Eloi Espin³, Prof Sebastiano Biondo⁴, Dr Daniel Casanova¹, Prof Josep M Badia¹

¹Hospital General Universitari de Granollers, Granollers, Spain, ²Hospital Universitario la Paz, Madrid, Spai, ³Hospital Universitari Vall d'Hebrón, Barcelona, Spain, ⁴Hospital Universitari de Bellvitge, L'Hospitalet, Spain

Background

Surgical site infection (SSI) is the most common complication of colorectal surgery, with rates up to 20%. The specific measures described to prevent SSI in this type of surgery have shown different levels of implementation among colorectal surgeons. A gap may exist between the best evidence and practice with regards to SSI prevention in colorectal surgery. A survey was designed to know the actual application and the surgeons' beliefs about preventative measures in elective surgery among Spanish colorectal surgeons.

Methods

A web-based survey was distributed to the members of the Colorectal Chapter of the Spanish Association of Surgeons and the Spanish Association of Coloproctology (n=455). The questions aimed to determine the actual use of the measures in their hospital and the knowledge of prevention strategies and preferences of the surgeon. Among them were questions on the use of mechanical preparation of the colon (MPC) alone or combined with oral antibiotics, the use of systemic antibiotic prophylaxis, the patient skin preparation, the measures to protect the edges of the wound, the maintenance of normothermia, the use of perioperative hyperoxia, and whether surgical instruments were replaced with sterile equivalents before incision closure.

Results

354 colorectal surgeons responded (77.8%). A fast-track protocol for colorectal surgery was implemented in 62.3% of their units. In 32.9% of cases the surgeon had no feed-back of the SSI rate. The workload of the unit was > 100 cases per year in 74.3%. About 60% of respondents stated that there was evidence for hair clipping, use of alcohol solution for antiseptic skin preparation and perioperative normothermia, and reported use of these strategies. There was a discrepancy in the perceived evidence for and the self-reported use of omission of hair removal (40.9% vs 23%), wound edge protection (49.2% vs 69%), hyperoxia (49.8% vs 32.4%), glove replacement after finishing the anastomosis (40.3% vs 74.3%), surgical tools replacement prior to closing the incision (46.1% vs 74.3%), and saline wound lavage before closing the skin (27.9% vs 65.4%). Antiseptic coated sutures and negative pressure therapy on the closed wound are scarcely used (6.3% and 7.2%, respectively), in accordance with the respondents knowledge of evidence (13.4% and 12.1%). Most of respondents belief that oral antibiotic prophylaxis diminish SSI, either alone (55.7%) or in combination with MPC (80.4%), but is indicated only by 32.4% of surgeons. MPC is believed useful in all colorectal cases by 14.6% and only in rectal surgery by 67.8% of respondents, but is actually used in 85.8% and 95%, respectively. 70% of surgeons felt that it was a discrepancy between published guidelines and actual clinical practice. Check-lists, standardized orders, surveillance and educational programs and feed-back were rated most highly by surgeons, but few of these strategies were in place at their institutions.

Conclusions

Gaps in the translation of evidence into practice remain in the prevention of SSI in colorectal surgery. Some areas for improvement have been detected. Specific implementation strategies should be addressed in Spanish colorectal units.

Free Paper Session III: Infection prevention & surgical site infection

23. Effectiveness of a nationwide bundle approach to reduce surgical site infection. An observational cohort study in the Netherlands

Mr. SW de Jonge¹, Miss. QJJ Boldingh¹, Miss AH Koch¹, Dr. L Daniels^{1,5}, Dr. E.N de Vries^{1,6}, Dr. W.M. Ankum², Prof. MG Dijkgraaf³, Prof. dr. dr. MW Hollmann⁴, Prof. dr MA Boermeester¹

¹Department of Surgery, Academic Medical Center, Amsterdam, The Netherlands, ²Department of gynecologic surgery, Academic Medical Center, , Amsterdam, The Netherlands, ³Department of clinical epidemiology and biostatistics, Academic Medical Center, Amsterdam, The Netherlands, ⁴Department of anesthesiology, Academic Medical Center, Amsterdam, The Netherlands, ⁵Department of surgery, West Fries Gasthuis, Hoorn, The Netherlands, ⁶Department of surgery, Spaarne Ziekenhuis,, Haarlem, The Netherlands

Summary Background Data

Within the framework of a national healthcare safety initiative, a bundle of perioperative interventions was introduced in 2009 to prevent surgical site infections (SSI), the POWI (Post-Operative Wound Infection) bundle. Compliance to the bundle needs to be reported to the national Healthcare Inspectorate. However, the relationship between compliance and the actual reduction of surgical site infections is unknown.

Methods

An observational cohort study was conducted at the Academic Medical Center. Compliance with the POWI bundle, defined as: less than 10 door movements per hour, administration of antibiotic prophylaxis 60-15 minutes before the first incision, hair removal with a clipper, and a body temperature of 36-38 °C measured at the end of surgery, was recorded in the electronic patient record. Patients were followed for the occurrence of superficial and deep SSI according to the CDC (Center of Disease Control and Prevention) definition. The association between compliance with the POWI bundle and postoperative wound infections was investigated using a multivariate logistic regression model after correction for known confounders.

Results

A SSI was determined in 52 of 894 procedures (5.8%). In 100% of the patients, hair removal was done with a hair clipper when necessary. Compliance with the number of door movements, adequate body temperature and timing of antibiotic prophylaxis was 22%, 66% and 74%, respectively. Eleven percent of procedures were compliant with all the components of the bundle.

Compliance with none, one, two or all of the other three components resulted in 5.2%, 5.0%, 5.6% and 9.5% SSIs, respectively. After correction for known confounders by means of multivariate logical regression, no significant association was found between compliance with the POWI bundle and the risk of SSI (non-compliant with door movements: OR 0.92 [95% CI 0.46.1.86] , body temperature: OR 1.26 [95% CI 0.57.2.78], timing of antibiotic prophylaxis: OR 1.52 [95% CI 0.73.3.13]. Compliance with the full bundle was not associated with a lower probability of a POWI: OR 1.74 [95% CI 0.77.3.97].

Conclusion

No significant reduction of the risk of surgical site infections could be demonstrated with use of this POWI prevention bundle. New and more effective interventions or bundles of interventions are needed.

4. A survey to identify the breach between evidence and practice in the prevention of surgical infection among Spanish surgeons.

Dr. Josep M Badia¹, Dr. Inés Rubio-Pérez², Dr. Nares Arroyo-García¹, Dr. José M Balibrea del Castillo³

¹Hospital General Universitari de Granollers, Granollers, Spain, ²Hospital Universitario La Paz, Madrid, Spain,

³Hospital Universitari Vall d'Hebrón, Barcelona, Spain

Background

Surgical site infection (SSI) is the most common infection in acute hospitals in Spain and Europe. The numerous measures evaluated to prevent SSI have shown a varying grade of efficacy and have different levels of adoption among the surgical community. The knowledge of the grade of implementation of preventative measures for SSI is crucial prior to planning dissemination strategies.

Methods

Online survey among the members of the Spanish Association of Surgeons (AEC) to know the actual application of preventative measures, and to compare them with new recommendations issued by international organizations. The questions aimed to determine the actual use of the measures in their hospital and the personal preferences of the surgeon. Among them were questions on the existence of safety protocols in the operating theatres, the preparation of the surgical patient, the products used for surgical washing, the patient skin preparation before surgery, the measures to protect the margins of the wound, the maintenance of normothermy, the use of perioperative hyperoxia and whether surgical instruments were replaced with sterile equivalents for closure of the incision

Results

Most of the 835 responding surgeons work in National Health Service Hospitals. Surgeons of all sub-specialties answered. 90.4% of responders recommend a preoperative shower, with normal soap or chlorhexidine. 60% recommend hair removal, preferably clipping, although 30% still recommend shaving. The most commonly used antiseptic solutions in healthy skin and without mucosal proximity are chlorhexidine in alcoholic solution (41.7%) and povidone iodine in aqueous solution (39.2%), followed by chlorhexidine in aqueous solution (9.8%) or povidone iodine in alcoholic solution (8.2%). Only 51.9% of surgeons allow solution to air drying before applying surgical drapes. In 83.2% of cases surgeons operate with a single pair of gloves. The systematic use of plastic adhesive incise drapes to protect the surgical field is only 9.4%, but 44% use it selectively depending on the type of surgery. Perioperative normothermia and hyperoxia were used in 92% and 27.9% of cases, respectively. In a laparotomy, the most common method for wound edge protection is a plastic double-ring device (33.1%), followed by gauze (23.9%), plastic single-ring protector (14.5%), cotton drape (12.6%), or waterproof drape (5.5%). 6.6% do not protect the wound edges in a laparotomy. At the end of a clean-contaminated or contaminated procedure, 47.1% of respondent surgeons always uses sterile replacement surgical instruments prior to closing the incision, 40% only change them selectively and 12% never do so. Before closing a laparotomy, peritoneal and wound lavage are used, in most cases with saline. Antimicrobial impregnated sutures are rarely used (85.7%) by surgeons, and 32% occasionally use negative pressure therapy on the closed wound.

Conclusions

There is great variability in the level of awareness and application of the main measures of SSI prevention among Spanish surgeons. Several areas for improvement have been detected, as some core prevention measures are not in common use, and discontinued practices are continued to be used. These practices should be addressed by the AEC by drafting specific recommendations for the prevention of SSI in Spanish hospitals.

32. Demonstrating success in reducing adult cardiac surgical site infections and the economic impact of using multidisciplinary collaboration

Ms. Lilian Chiwera¹, Dr Neil Wigglesworth¹, Dr William Newsholme¹, Mr Gianluca Lucchese¹, Mrs Carol McCoskery¹

¹*Guy's & St Thomas' Nhs Foundation Trust, London, United Kingdom*

Background

Cardiac surgical site infections have devastating consequences for patients and present several challenges for healthcare providers. Adult cardiac surgical site infection surveillance commenced in 2009 at Guy's & St Thomas' NHS Foundation Trust as a patient safety initiative amid reported increased incidence of surgical site infections (SSIs). Before this time, infection incidence was unclear because data collection was not standardised.

Aims

We sought to establish baseline SSI rates through standardised SSI surveillance and employ evidence based targeted interventions within clinical governance structures in order to improve quality, safety and efficiency in line with our organisational targets.

Methods

We developed, standardised and established local data collection protocols in line with Public Health England recommendations, followed by identification of local champions. We undertook prospective SSI surveillance with strong leadership using a multidisciplinary collaborative approach to enable us to identify potential practice concerns and address them more effectively through a series of initiatives. Surgical site infection surveillance forms which captured patient demographic data and wound status were completed by clinical staff; a surveillance team consisting of a team leader and two support workers coordinated data collection and reporting.

Results

Overall adult cardiac SSI rates fell from 5.4% in 2009 to 1.2% in 2016 and Coronary Artery Bypass Graft (CABG) rates from 6.5% in 2009 to 1.7% in 2016, $p < 0.001$; considerably below the national average of about 4%. Gram negative bacteria were recognised as important causative organisms for most SSIs, followed by *Staphylococcus species* and polymicrobial isolates and were better controlled after introducing stringent infection control measures. We estimate a conservative cost avoidance of nearly £3 million pounds over an 8 year period.

Conclusion

We felt that the use of prospective surveillance, identification of local champions and adoption of a multidisciplinary collaborative approach facilitated the successful implementation of comprehensive evidence based infection control practice for patients undergoing cardiac surgery. This led to significant reductions in the incidence of avoidable SSIs and associated costs. We have now adopted a zero tolerance approach to avoidable SSIs and continue to investigate all SSIs using an established SSI detailed investigation protocol. Based on our findings, we strongly recommend the use of evidence based care bundled interventions, effective feedback of SSI data to clinical teams, identification of local champions and adoption of a multidisciplinary collaborative approach to reduce cardiac surgery SSI incidence. We feel that this approach will not only reduce the overall SSI burden, but can potentially address Gram negative, *staphylococcus aureus* or polymicrobial SSI challenges as well as reducing the burden of data collection. Most importantly, this improves surgical patient outcomes and supports the global fight against antimicrobial resistance.

43. Prosthetic infection of Sacral Nerve Stimulation devices leading to explant: can it be prevented?

Dr. Ines Rubio-Perez¹, Dr. Isabel Pascual¹, Sergio Torres-Cobos¹, Luis Asensio¹, Sara Gortazar¹, Begoña Peinado¹, Dr. Jose L. Marijuan¹

¹*Hospital Universitario La Paz, Madrid, Spain*

Sacral Nerve Stimulation (SNS) therapy has demonstrated efficacy for the treatment of various urinary and fecal conditions. It is a minimally invasive procedure, consisting on the percutaneous placement of an electrode through sacral foramina (usually S3) and a test phase. During this test phase a transcutaneous cable connects to an external battery, so special care must be taken to avoid infections or colonization of the electrode. If the patient improves >50% of symptoms (after usually 2-3 weeks test), a definitive battery is implanted in the upper gluteus area under sterile conditions. SNS can be adapted using different programmed options and has proven to improve patient's quality of life. In these patients, dependent on SNS for symptom control, an infection of the device can be catastrophic. Once prosthetic material is colonized or develops a chronic infection, it is very difficult to safe the device, as biofilm develops and antibiotic does not penetrate the foreign material, leading finally to explant. This complication is uncommon, but has an important impact on the patient and institution, as NRS therapy is expensive. The best strategy to avoid infection is an exhaustive prevention and prophylaxis program, specific for these patients. We reviewed our institutional series of SNS patients. Our institution first started to implant in 2004 with some isolated patients, and established as a reference center for this therapy from 2008 onwards. All patients are reviewed and followed in a specific SNS clinic with all complications registered prospectively. A total of 135 patients have been implanted for various indications to date. After an analysis of our series to assess complications, we detected a high rate of explants secondary to infections (6 cases from 2008-2015). Patients were 5 females/1 male, implanted for incontinence (2), constipation (3) and LARS (1). The most frequently isolated bacteria were *Staphylococci* (3 *S.aureus* and 1 *S.epidermidis*) with 1 patient presenting *P.aeruginosa* infection.

We established a specific prophylaxis protocol for SNS patients from 2015 to date, consisting on preoperative prophylaxis with 2g i.v amoxicillin/clavulanic, alcoholic chlorhexidine (2%) for surgical skin preparation, local disinfection of prosthetic material and subcutaneous tissue with diluted Gentamycin (80 mg) and subcuticular skin closure with monofilament sutures, with wound covered with steri-strips for >48 hours. After the implementation of the program there was only 1 case of infection registered, secondary to electrode contamination in a patient that did not follow indications during the test period, so the transcutaneous cable was not removed timely. There were no infections after final implants and no further explants secondary to infection since the protocol was introduced. In conclusion, SNS therapy is an effective treatment option for various colorectal and urologic conditions, with the number of implanted patients increasing worldwide. As a prosthetic device, it is especially important to avoid infections, that can jeopardize therapy. Prosthetic infections can force the removal of an otherwise successful therapeutic device. Prophylaxis and prevention programs are especially important to reduce these complications and should be mandatory in all institutions performing SNS.

6. Fighting the Resistance: Time to Rethink the Staphylococcus aureus Battle

Prof. Robert Sawyer¹, Ms. Kimberley Popovsky²

¹Western Michigan University, Kalamazoo, United States, ²University of Virginia, Charlottesville, United States

OBJECTIVE

Methicillin-resistant Staphylococcus aureus (MRSA) has been the focus of infection control efforts for decades. Multiple interventions have been attempted to reduce the rate of ICU-acquired MRSA infection, though in the US, the greatest changes in policy occurred in the 1990s, when the introduction of routine MRSA testing on admission and isolation practices became prevalent. Without other major changes, we hypothesized that MRSA rates have stabilized among surgical intensive care unit (SICU) patients since that time.

METHODS

All episodes of SICU-acquired *S. aureus* infection diagnosed at a single institution between 1997 and 2014 were analyzed. MRSA and methicillin-sensitive infections (MSSA) were compared using univariate analyses. Backwards, step-wise logistic regression analysis was used to identify predictors of hospital mortality following infection using the *a priori* selected factors of age, APACHE II score, admitting diagnosis of trauma, days of hospitalization prior to diagnosis, ventilator dependence, and methicillin resistance.

RESULTS: A total of 221 MRSA and 221 MSSA SICU-acquired infections were documented (overall *S. aureus* resistance rate = 50%). Lung and blood were the most common sites of infection. The highest rates of resistance occurred in 2000 and 2001 (70%). Targeted efforts to reduce MRSA were associated with reductions in 2002 and stable rates since (39% resistance), as well as a decrease in overall number of *S. aureus* infections (37 infections/year from 1997-2001, 20 infections/year from 2002-2014). Compared to MSSA, MRSA infection was associated with a greater age (57.9±1.1 versus 48.5±1.3 years, $p < 0.001$), APACHE II score (20.2±0.4 versus 18.2±0.4, $p < 0.001$), days from admission to infection diagnosis (21.5±1.5 versus 8.9±0.7 days, $p < 0.001$), and non-trauma diagnosis (59% versus 19%), as well as a higher in-hospital crude mortality (31% versus 16%, $p < 0.001$). However, multivariable analysis demonstrated mortality was associated with age, APACHE II score, days of hospitalization prior to infection, and a non-trauma admission diagnosis, but not methicillin resistance (C statistic = 0.81).

CONCLUSIONS

MRSA infection rates are stable and methicillin resistance is no longer associated with mortality among all ICU-acquired *S. aureus* infections. Further efforts to reduce *S. aureus*-associated morbidity should focus not on MRSA but on interventions that target MSSA as well as MRSA, including vaccinations, selective decontamination and microbiomic therapy.

51. Postoperative continuation of antibiotic prophylaxis and incidence of surgical site infection. A systematic review and meta-analysis.

Mr Stijn De Jonge^{1*}, Ms Quirine Boldingh^{1*}, Prof. Joseph Solomkin³, Prof. Patchen Dellinger⁴, Prof Bendetta Allegranzi², Prof. Marja Boermeester¹

¹AMC - UVA, Amsterdam, Netherlands, ²WHO, Geneva, Switzerland, ³University of Cincinnati College of Medicine, Cincinnati, USA, ⁴University of Washington Medical Center, Seattle, USA

**Shared first authorship as both authors have contributed equally*

Summary Background Data

The effectiveness of antibiotics is under threat by the global emergence of antimicrobial resistance (AMR). Misuse and overuse should be eliminated. One in six in-hospital prescriptions of antibiotics concerns surgical antibiotic prophylaxis (SAP) and frequently the regimen continues after surgery. An increasing body of evidence indicates that postoperative discontinuation of SAP may not be inferior to a prolonged postoperative regimen. If so, then postoperative antibiotic prophylaxis would be an unnecessary hazard for both the individual patient as the population. For the purpose of developing recommendations for the new World Health Organization (WHO) SSI prevention guidelines, a systematic literature review and meta-analysis were conducted on the effectiveness of postoperative antibiotic prophylaxis to reduce SSI in indicated surgical procedures. This work has been complemented with detailed information on antibiotic regimen, acquired through correspondence with the study authors and a comprehensive analysis taking in account timing of preoperative SAP and intraoperative redosing according to current standards of practice for SAP. The aim of this study is to determine the effect of postoperative continuation of antibiotic prophylaxis on the incidence of surgical site infection (SSI).

Methods

Major medical databases and trial registers were systematically searched for Randomized controlled trials (RCTs) comparing the effect of different perioperative antibiotic prophylaxis regimens. The endpoint of interest was the incidence of SSI. A random effects model was used and pooled estimates were reported as relative risk (RR), with the corresponding 95% confidence interval (CI). For studies that provide antibiotic prophylaxis within 60 minutes prior to incision and with repetition of the dose after twice the half-life, a priori subgroup analyses and meta-regression are planned in accordance with Subgroup analyses and meta-regression were planned a-priori for studies adhering to current standards of practice in SAP as defined by 1) redosing when procedure duration exceeded two times the half-life of the antibiotic agent 2) timing of the first preoperative dose within 60 minutes prior to incision and 3) the optimal regimen meeting both conditions.

Results

78 RCTs including 23,523 participants were included in the final analysis. There was no evidence for effect of postoperative continuation of SAP, ranging from less than 24 hours to more than 72 hours postoperatively, on the incidence of SSI when compared to postoperative discontinuation (RR: 0.88; 95%CI: [0.77-1.01]). Meta-regression showed that compliance with both adequate redosing and preoperative timing of antibiotic prophylaxis, according to current standards of practice, is an independent predictor of the potential effect of continuation of antibiotic prophylaxis (P = 0.030). There is no effect found when antibiotic use was described according to these standards (RR: 1.07, 95% CI: [0.88-1.32]). Only when standard practice of antibiotic prophylaxis was not met, an effect of continuation was found (RR: 0.77, 95% CI: [0.64, 0.93]).

Conclusions

Postoperative continuation of antibiotic prophylaxis does not reduce the risk of surgical site infection when compared to postoperative discontinuation, and should therefore be avoided in order to stop further contribution to antimicrobial resistance.

3. Reduction of Surgical Site Infections in elective colorectal surgery after the first year of implementation of a bundle of care

Dr. Josep M Badia¹, Dr. Miguel Pera-Román², Dr. David Parés³, Dr. Adam Martín-Grillo⁴, Dr Doménico Fraccalvieri⁵, Dr Jesús Bollo⁶, Dr Enric Limón-Cáceres⁷, Dr Francesc Gudiol⁷, Dr Miquel Pujol-Rojo^{5,7}

¹Hospital General Universitari de Granollers, Granollers, Spain, ²Hospital Universitari del Mar, Barcelona, Spain,

³Hospital Germans Trias i Pujol, Badalona, Spain, ⁴Hospital Universitari de Girona Josep Trueta, Girona, Spain,

⁵Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat, Spain, ⁶Hospital Universitari Sant Pau, Barcelona, Spain, ⁷VINCat, Barcelona, Spain

Background

Surgical site infection (SSI) is the most frequent complication of elective colorectal surgery, with rates up to 25%. The “bundle” approach, grouping measures with the highest evidence, has proven to be effective for SSI prevention. The Nosocomial Infection Surveillance Program in Catalonia (VINCat) monitors SSI in elective colorectal surgery since 2007 in 52 hospitals (7 million population). These hospitals perform active and prospective standardized surveillance of elective colorectal resections. Post-discharge surveillance is mandatory within 30 days after surgery. Between 2007 and 2015, the SSI rate did not change significantly, with a cumulated incidence of 5,491 SSI in a total of 29,006 interventions (19%). In 2015, a working group of VINCat specialists and surgeons from the Catalan Society of Surgery was set up to formulate a specific bundle of SSI preventative measures for colorectal surgery.

Aim

To analyse the effect of a specific bundle for SSI prevention in elective colorectal surgery.

Methods

In 2016, a bundle of six preventative measures for SSI was recommended to the hospitals participating in the VINCat Program. Bundle measures were: systemic antibiotic prophylaxis, oral antibiotic prophylaxis, mechanical preparation of the colon, laparoscopic surgery, postoperative normothermia, and double-ring plastic wound retractor.

Results

In 2016, 4,682 procedures were registered. 43% of the patients were women, the duration of surgery was >180 minutes in 32% of cases, the NISS index was 0 or -1 in 71%, 1 in 24% and 2 in 4%. Laparoscopy was performed in 66% of the procedures. SSI was detected in 590 cases (12.6%), representing a 25% decrease compared to the 2015 rate (16.7%). As in previous years, a significant variation in SSI rate was detected among hospitals. The decrease in overall SSI was observed both in colon (390/3,395; 11.49%) and rectal surgery (200/1,287; 15.54%). The organ-space SSI also decreased in colon (212/3,395; 6.1%) and in rectal surgery (106/1,287; 7.7%). Information about the bundle implementation was complete in 1,582 cases (33.8%). Measures with an impact on overall SSI were antibiotic prophylaxis ($p = 0.035$), oral antibiotic ($p < 0.001$), mechanical preparation ($p < 0.001$) and use of the wound protector ($p = 0.002$). Only oral antibiotic prophylaxis ($p < 0.001$) and mechanical preparation ($p < 0.001$) resulted to be protective measures of organ-space SSI.

Conclusions

In the first year of application of the bundle, a decrease of 25% in the SSI rates has been found. All the measures included in the bundle have shown high preventive impact on SSI rate. Preventative measures for overall SSI in colon and rectal surgery are laparoscopic approach, systemic antibiotic prophylaxis, oral antibiotic prophylaxis, mechanical preparation of the colon, and double-ring wound retractor. Oral antibiotic prophylaxis and mechanical preparation have been shown to be protective measures for organ-space SSI.

22. Surgical Site Infection in Elective Colon & Rectal Resections: Effect of Oral Antibiotics

Dr. Amandeep Ghuman¹, Dr. Naomi Kasteel², Dr. Carl Brown³, Dr. Ahmer Karimuddin³, Dr. Manoj Raval³, Dr. P. Terry Phang³

¹University of British Columbia, Vancouver, Canada, ²University of Calgary, Calgary, Canada, ³St. Paul's Hospital, Vancouver, Canada

Keywords: SSI, colorectal, oral antibiotics

Introduction

Surgical site infection (SSI) is a significant complication of colorectal surgery and remains one of the highest amongst all surgeries. Role of mechanical bowel preparation (MBP) with oral antibiotics has been shown to be effective, but is not yet a standardized practice and varies based on surgeon preference. Here, we assess the effect of the addition of oral antibiotics with MBP on SSI rates.

Methods

Retrospective cohort study of consecutive, elective colon and rectal resections at a single academic center, before (n=307) and after (n=189) addition of oral antibiotics from September 1 2014 to September 30 2016. All patients followed our ERAS protocol, which includes MBP, oral carbohydrate loading, warming blankets, IV antibiotics, subcutaneous heparin, hair clipping and chlorhexidine skin prep. SSIs were assessed using CDC criteria. SSIs were compared before and after addition of oral antibiotics using chi-squared analysis. A subgroup analysis was performed on colon and rectal resections independently. Univariate analysis was performed on potential SSI risk factors, followed by a multivariate logistic regression analysis with adjusted odds ratio (OR, 95% confidence interval).

Results

SSI rates from pre vs. post intervention were: overall 19.9% vs. 9.5%, $p < 0.05$; superficial 9.8% vs. 3.7%, $p < 0.05$; organ space 10.1% vs. 5.8%, $p = 0.06$. Subgroup analysis on colon resections only SSI rates from pre vs. post intervention: overall 17.9% vs. 4.6%, $p < 0.05$; superficial 12.0% vs. 3.8%, $p < 0.05$; organ space 6.0% vs. 0.9%, $p < 0.05$. SSI rates for rectal resections pre vs. post intervention: overall 22.8% vs. 16.3%, $p = 0.26$; superficial 6.5% vs. 3.8%, $p = 0.36$, organ space 16.3% vs. 12.5%, $p = 0.41$. Univariate analysis was performed on the colon resections and yielded significant effects for age (0.97, 0.95-2.00), open vs. MIS (6.35, 2.57-15.67), MIS converted to open vs. MIS (4.57, 1.78-11.75), BMI (1.07, 1.02-1.13), wound protector (0.37, 0.18-0.75), oral antibiotics (0.22, 0.08-0.58) and surgery date (0.94, 0.89-0.98), but not for sex, lesion location, OR duration, stoma, wound class, ASA score, smoking, diabetes, steroid use, negative pressure wound dressings or surgeon. On multivariate analysis, open vs. MIS ($p = 0.01$), MIS converted to open ($p = 0.005$) and oral antibiotics ($p = 0.02$) remained as significant SSI factors.

Discussion

Significant reduction in SSI was found after adding oral antibiotics to MBP. Subgroup analysis revealed significant reduction in superficial and organ space SSIs for colon resections, but not for rectal resections. Operative technique (MIS vs. open and MIS converted open) also had a significant effect on SSI. Small post-intervention number limits assessment of wound protectors and negative pressure wound dressings. Further investigation is needed to understand isolated effects of oral antibiotics.

Poster Session I

5. ACUTE APPENDICITIS. THE RELATIONSHIP BETWEEN SYMPTOMS, PREOPERATIVE SEROLOGICAL DETERMINATIONS AND HISTOLOGY. OBSERVATIONAL RETROSPECTIVE ANALYSIS. A SCORE FOR PREDICTING COMPLICATED APPENDICITIS.

Dr Anibal Medina Velasco¹, Dr. Vladimir Arteaga Peralta¹, Dr. Aylhin Lopez Marcano¹, Dr Roberto De La Plaza Llamas¹, Dr. Begoña Gonzalez Sierra¹, Dr Raquel Latorre Fragua¹, Dr Alba Manuel Vazquez¹, Dr. Cristina García-Amador¹, Dr Daniel Diaz¹, Dr Jose Manuel Ramia Angel¹

¹Guadalajara University Hospital, Guadalajara, Spain

Key words: appendicitis; diagnosis; prediction model.

BACKGROUND

To analyze whether clinical and analytical parameters differ according to histopathology in cases of acute appendicitis (AA).

MATERIALS AND METHODS

This is a retrospective, observational study including patients (>14 years of age) admitted for suspicion of AA from 1 April 2014 to 31 July 2016. Histopathology was divided into complicated (including perforated and gangrenous AA) and uncomplicated appendicitis (phlegmonous). Sex, age, temperature of patients on admission to the Emergency Department, symptom duration, preoperative white blood cell (WBC) count, neutrophil percentage, mean platelet volume (MPV), platelet distribution width (PDW), C-reactive protein (CRP) and hospital stay were compared in the two groups.

RESULTS

Three hundred and thirty-five patients were analyzed, and 284 were included. Appendicitis was uncomplicated in 194 (68.3%) and complicated in 90 (31.7%). Age, symptom duration, neutrophil percentage, CRP and hospital stay were higher in the complicated AA group ($p < 0.05$). The mean differences between uncomplicated and complicated AA were: age 13.2 years (95%CI: 8.2-18.2), symptom duration 14.1 hours (95%CI: 6.3-21.9), neutrophil percentage 5.0% (95%CI: 3.2-6.8), CRP 73.6 mg/L (95%CI: 50.0-97.2) and hospital stay 2.2 days (95%CI: 1.4-3.0), with $p < 0.05$ for all these variables. A model based on the preoperative parameters (age, symptom duration, neutrophil percentage and CRP) was calculated to predict the likelihood of complicated AA. The receiver operating characteristic (ROC) curve had an area under the curve of 0.80 (95% CI 0.75-0.85).

CONCLUSION

This model is able to diagnose complicated AA without the need for imaging techniques, thus reducing both time to diagnosis and cost.

7. Diabetic foot infection, Microbiological profile and antimicrobial resistance in a tertiary referral center in Lebanon.

Prof Jamal Hoballah¹, Mr Omar Najjar², Mr Omar Itani¹, Dr Rola Jaafar¹, Dr Nesrine Rizk¹, Prof Fadi Haddad¹, Dr. Lamia Jouhar¹

¹*American University Of Beirut, Beirut, Lebanon*, ²*John Hopkins School of Medicine, , US*

Keywords: Diabetic foot, bacterial infection, antimicrobial resistance.

Background

Diabetic Foot Infection (DFI) is a challenging complication of Diabetes with a high burden in the Middle East where there is marked increase in diabetes prevalence and complications. Early detection of the diabetic foot infection and the culprit organisms would result in the early initiation of appropriate antibiotics. Appropriate therapy can improve the outcomes and prevent non-healing and osteomyelitis. There are differences in the microbiological profile of DFI between various countries. There is a lack of established local guidelines in our region, therefore, we set to determine the microbiology profile and antimicrobial susceptibility of the DFI at a large tertiary referral center in Beirut.

Objective

This study aims to determine the microbiological profile of DFI and antimicrobial susceptibility of associated organisms in a tertiary referral center in Lebanon. The data could be used to establish local clinical guidelines for DFI antimicrobial treatment.

Methods

This is a retrospective observational study of patients with DFI admitted to the American University of Beirut Medical Center from January 2008 to June 2017. The bacteriological isolation and antimicrobial sensitivity tests were carried out by standard microbiological methods.

Results

A total of 356 diabetic patients (254 males and 102 females) with a mean age of 67 were admitted with the diagnosis of diabetic foot ulcer. Out of them, 319(90%) had infected foot ulcer and deep tissue culture was taken in 179 patients. From 179 deep tissue culture, 314 bacterial isolates were obtained. Fifty-four percent of patients had poly-microbial infection. Aerobic gram-negative rods (GNR) were more prevalent than gram-positive cocci (GPC) (55%, 39% respectively). The most common isolate was *E.coli* (15%) followed by Enterococcus (14%) and *P.aeruginosa* (11%). *S.aureus* isolates accounted for 9% with 50% of them being methicillin resistant. Among Enterobacteriaceae, 37% of isolates were fluoroquinolone resistant, 25% were ESBL producers and 2% were carbapenem resistant. Antibiotic resistance was significantly associated with previous usage of antibiotics before admission. Anaerobes were isolated in 1% and Candida yeast in 5% of isolates. By comparing swab and deep tissue cultures, swab culture showed a sensitivity, specificity PPV, NPV of (76%, 72%, 76%, 72%) and (94%, 81%, 91%, 86%) for gram positive and gram-negative organisms respectively.

Conclusion

The microbiological profile of DFI in Lebanon is comparable to other countries in the MENA region with big differences compared to the western countries. This fact stresses the need for the creation of local guidelines for antimicrobial treatment. The high prevalence of GNR in DFI and the high fluoroquinolone resistance should be taken into consideration when choosing empiric antibiotics. Empiric treatment for MRSA or Pseudomonas does not appear necessary except for patients with risk factors for true infection.

36. Variation in classification and postoperative management of complex appendicitis: an international survey.

Miss. Elisabeth de Wijkerslooth¹, Miss. Anne Loes van den Boom¹, Dr. Bas Wijnhoven¹
¹*Erasmus MC, Rotterdam, Netherlands*

Keywords: appendicitis; classification; antibiotic prophylaxis.

Background

Data on common practice in the management of patients with complex appendicitis is scarce, especially for the adult population. Variation in the definition of complex appendicitis, indications for and the type of prolonged antibiotic prophylaxis has not been well-studied yet. The aim of this study was to document current practice of the classification and postoperative management of complex appendicitis on an international level.

Methods

An online survey was dispersed among practicing surgeons and surgical residents. Survey questions pertained to the definition of a complex appendicitis, indications for antibiotic prophylaxis after appendectomy, the duration, route of administration and antibiotic agents used.

Results

Some 149 survey responses were eligible for analysis. Most respondents were from Northern or Western Europe and were specialized in gastrointestinal surgery. Opinion varied substantially regarding the management of appendicitis, in particular for phlegmonous appendicitis with localized pus, gangrenous appendicitis and iatrogenic rupture of appendicitis. The most common duration of postoperative antibiotics was evenly spread over <3, 3, 5 and 7 days. Whereas most respondents indicated a combined intravenous and oral route of administration was common practice, 27% answered a completely intravenous route of administration was standard practice.

Conclusion

Current practice patterns in the classification and postoperative management of complex appendicitis are highly variable.

29. INTRAABDOMINAL INFECTIONS (IAIs) WITH SEVERE SEPSIS IN A COMMUNITY HOSPITAL

Dr. Sofia Taximi¹, Dr Parmenion Patias¹, Dr Konstantinos Katsaros¹, Dr Ioannis Massalis¹, Dr George Konstantoudakis¹, Dr George Euthimiou¹, Dr Panagiotis Gkanas¹

¹*Surgical Department, General Hospital of Nafplion, Nafplion, Greece*

Keywords: peritonitis, sepsis, intraabdominal infection

Background

Complicated Intraabdominal infections (IAIs) are frequently associated with a systemic inflammatory response, which can rapidly progress into septic shock and multi-organ failure. Despite advances in intensive care medicine and surgical techniques, IAIs remain a condition with a high morbidity and mortality.

Aim of the study

The aim of this study is to evaluate the outcome of the patients with severe intraabdominal infections treated in our department.

Patients and Methods

This is a 4-year (2014-2017) retrospective study of 42 patients (18 female and 24 male) who were diagnosed with severe IAIs and were managed by our surgical team. Diagnosis was established by clinical evaluation, abdominal U/S and CT scan. All these cases were secondary peritonitis with severe sepsis and they were operated immediately after their definitive diagnosis was determined. All the patients received complementary treatment with crystalloid fluids, combination of antibiotics and, in 10 cases (24%), inotropic agents.

Results

All of these patients were operated in our department, suffering from severe peritonitis. 25 patients (60%) had hollow organ perforation (10 perforated duodenal ulcer, 9 small bowel perforation, 6 colon perforation), 11 cases (26%) were intraabdominal abscesses, 4 (9%) bile peritonitis, 2 (5%) intestinal ischaemias.

34 (81%) of the patients were discharged from our unit after mean hospital stay of 10 days, 4 (10%) patients were transferred to the ICU unit and 6 (14%) patients died of septic shock and multiple organ failure (4 patients from our unit and 2 of the transferred to the ICU patients). The postoperative complications presented in 45% of the patients and were the following: wound infection (12 patients), pneumonia (4) and urinary tract infections (3). None of the patients needed reexplorative laparotomy. The 34 patients were discharged without any residual problem.

Conclusion: Successful management of IAIs is multi-factorial. The cornerstone of high survival rate in these severe cases is the early recognition of sepsis in the outpatient department, the rapid diagnosis and the very early and effective surgical control of the septic source.

45. Do's and Don'ts in wound care with Negative Pressure therapy: learning from our experience.

Ms Estibaliz Álvarez¹, Prof Ines Rubio¹, Ms Maria Heras¹, Ms Begoña Peinado¹, Mr Sergio Cobos¹, Mr Luis Asensio¹, Dr Jose Luis Marijuan¹, Prof Joaquin Diaz¹

¹*Hospital Universitario La Paz, Madrid, Spain*

Negative Pressure Wound Therapy (NPWT) can be a very useful tool for the prevention and treatment of wound infections in surgical patients, especially for those presenting a high risk due to comorbidities, obesity, emergency or contaminated surgery, etc. Since the recent update of the WHO infection prevention guidelines recommending NPWT as a possible prophylactic tool, there has been an increased interest on the subject and some controversy regarding its generalized application. There are different commercial devices available for NPWT, some even including instillation. One of the main issues with this therapy is to adequately select the device for each kind of wound, as many are not equivalent, have different specifications, absorbance capacities, etc. Every-day clinical problems related to NPWT can be misuse secondary to wrong device or patient selection and generalization of indications between all commercially available devices. We decided to do a comprehensive review of all patients that had received NPWT either for prophylaxis or treatment of wound complications and analyse specific cases and factors related to treatment failure or inadequate use.

We selected representative patient cases to illustrate our findings, and the most relevant detected problems and therapy complications were the following:

1. Volume of wound exudate should be estimated prior to the selection of the NPWT product. In very exudative wounds, dressing-only devices (with no container) should not be selected, as they condition a high number of dressing changes and can macerate the wound.
 - The presence of hematoma in the open wound should prevent from using dressing-only NPWT devices, as the vacuum may be unable to evacuate the dense hematoma or saturate
 - the system with blood. In these cases, hematoma should be carefully evacuated (if possible) and once the wound is clean NPWT can be reconsidered. In the case of closed wounds with hematoma, NPWT over the wound can help prevent progression and favour reabsorption. This can be especially useful as prophylaxis in patients with previous anticoagulation.
 - Associated products introduced into the wound (such as silver dressings and foams) can become integrated in the patient's tissues due to the continuous negative pressure (NP) if they are left in place for too long. They may complicate the normal healing and block the NP system, so special care must be taken if applying these products and compatibility with the selected device must be confirmed.
 - Skin irritation and maceration is very common, despite the silicon films of the dressings are supposed to be skin-friendly, the various dressing changes and constant exudation can result in painful blisters. It is especially important to perform a correct hygiene and exhaustive care of the skin before application of NPWT films.
 - Obesity can be a crucial factor for device selection. Even in small wounds, patients with BMI >25-30 can present a higher incidence of seromas and wound infections. In these patients, prophylactic therapy can be considered, especially in naturally humid anatomical locations (such as groin, axilla and pubis) or intense subcutaneous surgical dissection.

31. A Multi-Hospital Collaboration to Promote Quality Improvement: The Cardiac SSI Network

Mr. Carlos Morais¹, Ms Melissa Rochon¹, Ms Sarah Battaglia², Ms Philippa Clark³, Ms Kate Turkentine², Ms Christina Bannister⁴, Ms Lisa Butcher⁵, Ms Sandra Hutton⁵, Ms Lillian Chiwera⁶, Mr Martin Still⁷, Ms Elizabeth Silva⁸, Ms Sammra Ibrahim⁸

¹Royal Brompton & Harefield NHS Foundation Trust, London, United Kingdom, ²University Hospitals Bristol NHS Foundation Trust, Bristol, United Kingdom, ³Royal Papworth Hospital, Cambridgeshire, United Kingdom, ⁴University Hospital Southampton NHS Foundation Trust, Southampton, United Kingdom, ⁵Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom, ⁶Guy's and St Thomas NHS Foundation Trust, London, United Kingdom, ⁷Brighton & Sussex University Hospitals, Brighton, United Kingdom, ⁸Barts Health NHS Trust, London, United Kingdom

Background

Surgical site infection (SSI) is an important quality indicator for clinicians, policy makers and hospitals (Merkow et al., 2015). SSI following cardiac surgery is particularly costly (average cost per cardiac SSI readmission is £25,164, equivalent 28,355 EUR [Rochon et al., 2016] and mediastinitis is associated with a high mortality rate (Lepelletier et al. 2009, Charbonneau et al. 2014). Despite the high cost to patient and healthcare service, surveillance is not mandatory for cardiac surgery in the United Kingdom (Public Health England, 2013). Unsurprisingly, cardiac hospitals often develop quality improvement (QI) strategies to reduce the incidence of SSI in isolation. To address this, we established a Cardiac SSI Network as a way to promote cardiac surveillance innovations, and spread of initiatives to reduce SSI.

Aim

The aim of this study was two-fold: to determine the sustainability of the Cardiac SSI Network and to identify collaborative works in SSI surveillance arising from the Network.

Methods

We assessed the sustainability of the Network using the LongTerm Success Tool (LTST), developed by National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care for Northwest London (Lennox et al. 2017). LTST examines twelve factors that influence sustainability in order to identify and address risks to maintaining quality improvement (QI). Eight cardiothoracic centres (representing nine hospitals) completed the assessment tool. Although the membership extends beyond this core group, these eight centres have responsibility for organising meetings and Network activities.

For evidence of Network collaboration, we obtained examples from members via email communications and confirmed these with an electronic search of the web.

Findings

Overall, feedback from the eight core hospitals suggests the views held by members are cohesive. The strongest results were in *Commitment to the Improvement* domain, and the lowest scored or greatest risk to sustainability identified by the members as the *Alignment with External Political and Financial Environment* domain. Examples of collaborative efforts include co-publication (hospitals 1,5,7); implementing QI projects together (for example targeting patients at highest risk of SSI [hospitals 1,2]; Photo at Discharge project [hospitals 1,8], sharing SSI patient information videos [hospitals 1, 2, 6]; implementing a new support wear product with preadmission clinic [hospitals 1,4]) and have presented together at national conference [hospitals 1,5,3]. The largest collaborative effort to date by the core members was the co-creation of www.cardiacssinet.com, an online platform to share projects and innovations to reduce SSI in cardiac surgery (1, 2, 3, 4, 5, 6, 7 and 8).

Conclusion

Results of this study suggest that the shared view of its members will help maintain the Cardiac SSI Network. Cardiac SSI Network has frontline examples of shared innovation and projects to reduce cardiac SSI; further study on the impact of this model are warranted.

References

- Charbonneau H, Maillet JM, Faron M, Mangin O, Puymirat E, Le Besnerais P, Puy-Montbrun LD, Achouh P, Diehl JL, Fagon JY, Mainardi, JL and Guerot, E (2014) *Mediastinitis due to Gram-negative bacteria is associated with increased mortality*. *Clinical Microbiology and Infection*. 20(3):O197-O202
- Lennox L, Doyle C, Reed JE and Bell D. (2017) *What makes a sustainability tool valuable, practical and useful in real-world healthcare practice? A mixed-methods study on the development of the Long Term Success Tool in Northwest London*. *BMJ Open*. 7(9):e014417
- Lepelletier D, Poupelin L, Corvec D, Bourigault C, Bizouam P, Blanloeil Y, Duveau D and Despins P (2009) *Risk factors for mortality in patients with mediastinitis after cardiac surgery*. *Archives of Cardiovascular Diseases*. 102(2):119-125
- Merkow RP, Ju MH, Chung JW, Hall BL, Cohen ME, Williams MV, Tsai TC, Ko CY and KY Bilimoria (2015) *Underlying reasons associated with hospital readmission following surgery in the United States*. *JAMA* 313(5):483-495.
- Public Health England (2016) *Protocol for surgical site infection*: June 2013. PHE, London
- Rochon M, Makecha S, Morais C, Luff D, Richardson Persaud-Rai B, Tibbles S, Joseph D, Sriram V, Cowell G, Roberts A, Trimlett R, Yadav R, Raja S and Desouza A. (2016) *A quality improvement approach to reducing readmission for surgical site infections*. *Wounds UK*. 12 (2): 26-31

15. Imipenem-cilastatin resistant bacteria in gangrenous acute cholecystitis. A 4-year experience.

Dr. Anibal Armando Medina Velasco¹, Dr. Daniel Alejandro Díaz Candelas¹, Dr. Vladimir Arteaga Peralta¹, Dr. Cristina García Amador¹, Dr. Aylhin Joana López Marcano¹, Dr. Begoña Gonzalez Sierra¹, Dr. Alba Manuel Vázquez¹, Dr. José Manuel Ramia Ángel¹, Dr. Roberto De la Plaza Llamas¹, Dr. Raquel Latorre Fragua¹, Dr. Carmen Ramiro¹, Dr. José Manuel García Gil¹, Dr. Ignacio Antonio Gemio del Rey¹, Dr. Julio Pato Fernández¹

¹Hospital Universitario De Guadalajara, Guadalajara, Spain

Keywords: Imipenem resistance, Acute Cholecystitis, Culture.

INTRODUCTION

Bacterial growing has been identified in 41-63% of cultures in patients with diagnosis of acute cholecystitis, being resistant to broad-spectrum antibiotics in certain cases. Higher morbidity, mortality and costs has been related with the presence of this kind of microorganisms. The objective of this research is to describe a case series of gangrenous acute cholecystitis, in which microbiology tests reports Imipenem-cilastatin resistance bacteria.

METHODS

A retrospective, descriptive and observational study of a case series of patients with pathology diagnosis of gangrenous acute cholecystitis with Imipenem-cilastatin resistance bacteria in the bile/peritoneal liquid cultures. The data collection was made by reviewing the electronic clinical history (Mambrino XXI ®) during a 4-year period. Variables studied were age, sex, length of hospitalization, SOFA, Tokyo level, preoperative c-reactive protein (CRP) levels, bile and peritoneal liquid culture and antibiogram, intensive care unit (ICU) admission and mortality.

RESULTS

A total of 104 medical records were reviewed. We found 08 cases in which cultures were positive for Imipenem-cilastatin resistant bacteria (8%), being male in 63% of the cases. The median age was 74 years with an interquartile range (IQR) of 60-79. Hospital stay was 07 days in average (Median) IQR: 4-16. The median SOFA level was 03 points IQR: 2-4,5, preoperative CRP levels: 315 mg/dl (median) IQR: 242-328 mg/dl. The most common Tokyo level was II (87,5%) followed by III (12,5%). Culture results were polymicrobial in 88% of cases. The isolated imipenem-cilastatin resistant bacteria were the *Enterococcus faecium* in 07 cases (87,5%) and *Proteus vulgaris* in one case (12,5%). No ICU admission was needed. Mortality was 13%.

CONCLUSIONS

Broad-spectrum antimicrobial resistance is considered a serious public health problem, with an important impact on serious diseases, such as the acute cholecystitis. Careful management and surveillance of antimicrobial therapy is necessary in these cases.

46. Multidisciplinary approach to treatment of patients with unformed intestinal fistulas.

Mr. Ildar Batyrshin¹, Prof. Andrey Demko¹, Prof. Sergey Shlyapnikov¹, Ms Julia Ostroumova¹, Mr Dmitriy Skliskov¹, Dr. Nadja Naser¹

¹*St. Petersburg Science Research Institute For Emergency Care n.a. I. I. Dzhanelidze, Saint-petersburg, Russian Federation*

Actuality

ECF is an actual problem of the abdominal surgery. The mortality rate in these patients is 5-20%, and in the case of unformed fistulas reaches 66%.

Materials and methods

We developed tactics of complex approach to treatment of patients with unformed ECF. It consists of 2 stages. Stage I: treatment and prevention of infectious complications, nutritive and metabolic therapy, local wound treatment.

The task of the first stage is the spontaneously healing of the fistula, or the transformation into the formed through recovery of nutritional status and treatment of infectious. If the of fistula has not spontaneously healed, stage I is considered as preparation phase. The second stage, reconstructive, provides for the surgery interventions aimed at eliminating the formed fistula no earlier 3 months. 23 patients with unformed ECF were treated In the period from 2014 to 2017 in our hospital in according to this protocol. Men were dominated - 17(74%). The median age was 52.4+/-14. In the majority of patients 21(91%) ECF developed after repeated operations on abdominal viscus. The main reason - 8(35%)of a fistula was a surgery for adhesive obstruction of intestine.

According to the anatomy, duodenal fistulas was 3(13%), intestine 15(65%),colon - 5 (22%). Among these patients - 22(96%) with single fistulas and 1 (4%) patient with multiple fistulas on one loop of the ileus. 3 (13%) patients had low-producing fistulas (< 200 ml). Patients with medium fistulas (200-500 ml) were also 3, with high - producing (> 500 ml) - 17(74%). The course of the disease in 19(82.6%) patients was complicated by sepsis.

Results

All patients have been done for US and CT abdomen the 2nd enhancement for diagnostics of liquid accumulations. Drainage or needle puncture under US control was performed in 4(17.3%) patients. In all cases drainage was effective. NPWT was used in 8(35%) patients in the course of local treatment of wounds. The Kolchanogov obturator in 2(9%) patients. Of the 23 patients, 20(87%) achieved stabilization of vital functions due to compliance with the principles of a conservative phase, and in 3(13%) of these were able to achieve complete healing of fistulas (2 duodenal fistula and 1 small bowel fistulas). In the 17 patients, stage I was ended as formed fistulas. Between them, 2 patients have been refused from reconstructive surgery. Both were discharged, but require nutritive and metabolic correction in hospital from time to time. The 15 patients were operated. One of them has been died from acute myocardial infarction, 14 –were discharged. Three patients were died due to progressive organ dysfunction. Thus, the lethal outcome occurred in 4(17.4%) patients.

Conclusions

Due to the severity of these patients, the advantage should be given to minimally invasive methods of drainage of the liquid accumulations, which helps to control intra-abdominal infectious sources.

The use of NPWT in the treatment of patients with unformed intestinal fistulas is an effective and promising technique that requires further study.

The use of a complex 2-stage approach can significantly improve the results of treatment of patients with unformed ECF.

Poster Session II

16. Negative Pressure Therapy in the Surgical Treatment of Diabetic Foot

Dr. Bogdan Mihnea Ciuntu¹, dr. Clprian Vasilut¹, Dr. Dan Vintila¹, Prof Doina Azoicai¹, Prof. Stefan-Octavian Georgescu¹

¹Umf Iasi, Iasi, Romania

The study aims to assess the significance of negative pressure therapy in the treatment of diabetic foot. The objectives intend to evaluate the healing time required after applying the method and the functional consequences for the patient. A prospective study was conducted on a sample of 42 patients with diabetic foot who were monitored their clinical course between September 2014 - November 2017, following negative pressure therapy. There were used vacuum assisted closure devices (VAC[™] -Hartman) in order to apply negative pressure to the wound, while complying with specified settings (negative pressure, time of use of a kit) in accordance with patients' outcome. There were monitored changes in wound size (planimetric and volumetric measurement), their bacterial load and duration of treatment. Healing was obtained in all cases, to an average hospital stay of 27 days and 8 days of therapy application. The negative result of microbial cultures was obtained after an average of 6 days by simultaneous application of negative pressure and antibiotic treatment according to the antibiogram. Skin grafts were necessary to close the defect in 4 cases. After basic treatment of the wound, auxiliary methods such as negative pressure contribute to the healing. In patients with diabetic foot who were required surgical intervention, the use of negative pressure therapy yielded a significant benefit in the preservation of the affected limb, after minimal excision. The results we obtained throughout our experience recommend use of NPTW technique as indication for abdominal wall surgery in closing abdominal wall defects, compartment syndrome and surgical site infection after prosthetic mesh.

Keywords: negative pressure, diabetic foot, wound volume

17. Endoscopic Vacuum Therapy used in treatment of oesophageal fistula at a patient with mediastinitis

Dr. Ciuntu Bogdan Mihnea¹, dr Clprian Vasilit¹, Dr. Vintila Dan¹, Prof. Stefan-Octavian Georgescu¹
¹*Umf Iasi, Iasi, Romania*

Oesophageal fistulas can lead to mediastinal disease and sepsis, leading to a significant increase in the period of hospitalization and even death of the patient. Treatment options should be done to drain the septic outbreak and allow the esophageal defect to close.

We present the case of a 73-year-old male in the urban area urgently hospitalized in the I-II Surgery Clinic of St. Spiridon Iasi Hospital claiming retrosternal pain accompanied by dyspnea, fever and profuse sweating. From the personal pathological antecedents, we retain the inferior oesophageal stenosis 1/3 for which endoscopic dilation was practiced in May 2017. The patient states the insidious onset of the symptomatology before the presentation about 5 days before the event correlated with the endoscopic esophageal dilatation.

Upon presenting in UPU Sf.Spiridon the clinical examination combined with the anamnestic data raises the suspicion of an iatrogenic esophageal perforation for which a thoracic CT examination with contrast is performed. The CT examination confirms the diagnosis suspicion by highlighting: Collection of 60/80/127 mm in the posterior mediastinum with inhomogeneous content, a 9 mm in diameter perforation at the anterior esophageal wall in medial section. We decided to delay the surgery and to apply minimally invasive treatment – endoscopic vacuum therapy (EVT). The patient was monitored in the Intensive Care Clinic following the biological saturation, the enteral and parenteral nutrition the functionality of the mounted device (lavage of the system to prevent clogging with secretions).

On day 29 after surgery, the endoluminal vacuum kit is suppressed under endoscopic control, with complete healing being observed.

EVT for defects in the esophageal wall is a valuable tool in managing this high mortality and should be considered by surgeons and gastroenterologists when discussing treatment options in these patients.

The major drawback in evaluating this promising new technique is the absence of comparative studies due to the complexity of the subject and the large number of different treatment options - such as different types of surgery and various types of stents and clipping devices.

Prospective and comparative studies are needed to further assess the importance of this new minimally invasive approach.

55. Surgical Site Infections (SSIs): Observation Study and Risk Factor Assessment in a Greek Surgical Department

Assoc Prof Ioannis Koutelidakis¹, Assist Professor Grigoris Chatzimavroudis¹, Assoc professor Vasilios Papaziogas¹, Mr Nikolaos Beratzes¹, Mr Nikolaos Voloudakis¹, Mr Theodoros Kaltsikis¹, Prof Emmanouil Christoforidis¹
¹*Medical School, University Of Thessaloniki, Thessaloniki, Greece*

Introduction

Surgical Site Infections (SSIs) are defined as infections of surgical field that occurs up to 30 days after surgical procedures and include superficial incisional SSI, deep incisional SSI and organ/space SSI. The current study aims to mention the incidence of SSI in our department and to observe the main risk factors.

Methods and Material

The study included all patients undergoing elective or urgent surgical procedures during the period of last one year (from 1/3/2017 to 20/2/2018) at the 2nd Surgery department of medical school of Aristotle University of Thessaloniki, Greece. The total number of patients was 875 and just 482 of them were finally evaluated in the study due to exclusion criteria. The multifactorial study included risk factors such as: Obesity, type of surgical procedure and ICU hospitalization.

Results

The total number of SSIs during this period was 25 out of 482 cases (5,2%), while 3,1% of them were emergency surgery procedures. Approximately 52% of patients had prolonged ICU hospitalization while the majority of patients were Obese. The species of microorganisms isolated, included: E.Coli , Klebsiella Pneumoniae and Pseudomonas Aeruginosa .

Conclusion

SSIs remain a burden in modern Surgical practice despite improving prevention measures with elevated rates of morbidity, mortality and high cost-effectiveness. To sum up the urgent surgical procedures have an increase rate of incidence in SSIs, while the ICU hospitalization and the Obesity are the major risk factors.

21. INTRAOPERATIVE SAMPLES OF BILE AND PERITONEAL LIQUID IN GANGRENOUS ACUTE CHOLECYSTITIS. DOES IT WORTH THE SIMULTANEOUS SAMPLING?

Dr. Daniel Alejandro Díaz Candelas¹, Dr. Anibal Medina Velasco¹, Dr. Vladimir Arteaga Peralta¹, Dr. Cristina García Amador¹, Dr. Aylhin López Marcano¹, Dr. Begoña Gonzalez Sierra¹, Dr. Alba Manuel Vázquez¹, Dr. José Manuel Ramia Ángel¹, Dr. Roberto De la plaza Llamas¹, Dr. Raquel Latorre Fragua¹, Dr. José Manuel García Gil¹, Dr. Gemio del Rey Ignacio¹, Dr. Cordova García Diego¹, Dr Lucía Diego García¹

¹*Hospital Universitario de Guadalajara, Guadalajara, Spain*

Keywords: Gangrenous Cholecystitis, Culture, Bile, Peritoneum.

INTRODUCTION

The gangrenous acute cholecystitis (GAC) is an acute surgical emergency that occurs in 4 - 40% of the total of urgent cholecystectomies. Treatment is the early cholecystectomy, with intraoperative findings of intra-abdominal free liquid in some cases. Microbiology analysis in bile and peritoneal liquid are diverse, being the gender *Escherichia* the most common isolated, followed by *Enterococcus* and *Clostridium*. In Europe there is a rising rate of antibiotic resistance in these microorganisms, which is why early identification should be done.

METHODS

A retrospective, descriptive and observational study of a case series of patients with pathology diagnosis of GAC. The data collection was made by reviewing the electronic clinical history (Mambrino XXI ®) during December 2012 - April 2017. Variables studied were age, sex, bile and peritoneal liquid culture and antibiogram results. The samples were taken intraoperatively using the Portagerm® as a transport medium. The review of the literature was made in PubMed using the following search strategy without limits: ("Cholecystitis, Acute"[Mesh]) AND ((bile culture) OR (peritoneal fluid culture) OR (culture)).

RESULTS

A total of 104 medical records were reviewed. The median age was 74 years with an interquartile range (IQR) of 61-83, being male in 70% of the cases. Simultaneously culture samples (bile and peritoneal) were taken in 53 patients (51%). Matching in bacterial culture growing were presented in 18 cases (34%), being sterile in 14 cases. The most common isolated microorganism was the *Escherichia* gender (21%) followed by *Enterococcus* (18%), *Clostridium* (15%) and *Streptococcus* (14%). The microbiological findings match with the reported in the literature reviewed.

CONCLUSIONS

Most of the bile and peritoneal fluid samples taken intraoperatively in patients with GAC did not match in the microbiological analysis. We recommend the simultaneous taking of bile and peritoneal liquid samples, however it is necessary to carry out prospective studies that confirm our results.

33. Fournier gangrene due to inguinal hydrosadenitis: case report.

Mr. Daniel Diaz Candelas¹, Miss. Aylhin Lopez Marcano¹, Dr. Roberto De La Plaza Llamas¹, Dr. Vladimir Arteaga Peralta¹, Miss. Cristina Garcia Amador¹, Mr. Anibal Medina Velasco¹, Miss. Begoña Gonzalez Sierra¹, Dr. José Manuel Ramia Angel¹, Dr. Raquel Latorre Fragua¹, Dr. Carmen Ramiro Perez¹, Dr. Alba Manuel Vazquez¹, Miss. Lucia Diego Garcia¹, Mr. Jose Manuel Garcia Gil¹, Mr. Ignacio Gemio Del Rey¹, Mr. Diego Cordova Garcia¹, Mr. Julio Pato Fernandez¹

¹H.U. Guadalajara, Guadalajara, Spain

Introduction

Fournier gangrene (FG) is a necrotizing and fulminating infection usually polymicrobial of the fascia and subcutaneous tissue of the perineal, genital and perianal regions. It requires aggressive treatment since it can have serious functional consequences and a high mortality. Precising urgent surgery, antibiotic treatment and in many cases intensive care.

Material and methods

We present a case of FG in a patient with a history of recurrent hydrodenitis

Results

A 30-year-old woman with a history of allergy to penicillin and its derivatives, smoker, Wolf Parkinson White syndrome, and bilateral inguinal hydradenitis intervened on 3 occasions, the last in May 2014 attended to emergencies due to pain in the left gluteus of 72h of evolution, without other accompanying symptoms. Physical examination showed hemodynamic stability, a lesion of approximately 10 cm poorly defined, with purulent suppuration and necrotic plaques, located in the perineal and left gluteal regions. Urgent surgery is performed evidencing a cavity with purulent content that is drained, sending sample for culture and extensive debridement of the affected region. Receives empirical treatment with ciprofloxacin and metronidazole. 24h later he presented elevation of acute phase reactants as well as progression of cutaneous necrosis, so that new urgent surgical treatment was performed with ample debridement of the region with a diagnosis of FG due to the torpid evolution of the lesions, so that the antibiotic therapy is modified to meropenem. It is maintained with bedside treatments with favorable evolution

The culture determined *Streptococcus dysgalactiae* ssp *Equisimilis*, *Prevotella bivia* and *Escherichia coli* sensitive to meropenem. Complete 10 days of meropenem. He was released on the 12th day with cures at his health center.

Discussion

The diagnosis of FG is based on clinical history and physical examination, with palpable crepitus under the skin and rapid progression with systemic repercussions.

FG is more frequent in men around the age of 50 with comorbidities, but cases have been described in young women as in the case described. Risk factors include immunocompromised patients, with more frequent diabetes or malnutrition, or recent history of catheterization, instrumentation or perineal surgery.

Microorganisms are usually of low virulence but there is a combination of gram positive, negative and anaerobic germs, generally of the normal digestive and perineal flora. Usually enterobacteria, in particular *Escherichia coli*, *Bacteroides* and *proteus* and other less frequent ones including *S. aureus*, *Streptococcus* sp., *Klebsiella* sp., And anaerobes. They secrete endotoxins that cause tissue necrosis and severe cardiovascular failure. The subsequent inflammatory reaction of the host contributes to multiorgan failure and death if left untreated Urgent surgical debridement should be performed and be repeated within 24 hours of presentation.

The initial antibiotic treatment should be broad spectrum, modifying it according to the culture and the clinical response.



Conclusions

GF requires early and complete surgical debridement, because late or inadequate surgery results in increased mortality. An antibiotic treatment that covers all the causative organisms should be administered. This can be adjusted after the results of surgical cultures

50. HYBRID (OPEN/LAPAROSCOPIC) TECHNIQUE FOR UMBILICAL HERNIA REPAIR IN AN OBESE AND IMMUNOSUPPRESSED PATIENT USING P4HB BIOSYNTHETIC, FULLY ABSORBABLE MESH

Associate Professor Ioannis Koutelidakis¹, Prof. Grigoris Chatzimavroudis¹, Professor Basilis Papaziogas¹, Dr Nikolaos Voloudakis¹, Dr Nikolaos Mperatze¹, Dr Georgia Kotoreni¹, Professor Emmanouil Christoforidis¹
¹2nd Surgical Department, School of Medicine, Aristotle University of Thessaloniki, G.Gennimatas General Hospital, Thessaloniki, Greece

Keywords: umbilical hernia; hybrid technique; P4HB mesh

Umbilical hernia can be repaired by open and laparoscopic approach. Compared with open approach, laparoscopic repair is associated with reduced risk of surgical site infection (SSI), especially in obese patients. However, its application is associated with i) increased incidence of bulging, especially when the hernia defect is not primarily closed with sutures and ii) increased rate of seroma formation, when the repair is not accompanied by hernia sac removal. For these reasons, a trend has been observed during last years in avoiding laparoscopic ventral hernia repair whenever the defect cannot be closed.

Moreover, nowadays specific factors (i.e. obesity, steroid use, diabetes mellitus, chronic pulmonary disease) have been recognized that increase the risk of SSI, even in clean cases, especially after ventral hernia repair and mesh implantation. In these cases the use of a biosynthetic fully absorbable mesh is considered to be a safe and effective alternative to permanent mesh.

We describe the case of a patient suffering from umbilical hernia with multiple risk factors for SSI who underwent hybrid (open/laparoscopic) hernia repair using a fully absorbable biosynthetic mesh suitable for intraperitoneal use. A 56-year-old male patient with a BMI of 38 and chronic use of steroids due to retroperitoneal fibrosis presented in our department for the repair of a medium-sized umbilical hernia. The overlying skin of the umbilical hernia was discolored due to chronic ischemia and the hernia content could not be manually reduced. A hybrid approach was decided, combining open and laparoscopic surgery. By this approach the hernia sac was fully excised, the defect was easily closed with sutures and the reconstructed anterior abdominal wall was reinforced with a fully absorbable biosynthetic mesh with hydrogel coating (PHASIXTM ST: P4HB mesh plus hydrogel barrier based on Septra[®] technology). The mesh was fixed intraperitoneally with long-term absorbable transfascial sutures and absorbable fasteners (OptiFixTM). The postoperative course of the patient was uneventful and the patient was discharged on the 2nd postoperative day in excellent condition. The 3-months follow-up of the patient was unremarkable with no signs of SSI, seroma formation, bulging or hernia recurrence.

In conclusion, a combined open and laparoscopic approach is a safe and effective minimally invasive technique that could be used in specific cases of ventral hernia repair. Moreover, the use of a biosynthetic fully absorbable mesh composed of P4PB is safe and effective in patients at increased risk for SSI.

30. Management of perineal, perianal and genital necrotizing fasciitis (Fournier 's gangrene): experience with 12 cases

Mr. Christos Chouliaras¹, Ms. Eleni Maniotti¹, Mr. Saimon Patsos¹, Mr. John Katogiritis¹, Mr. Giannis Demiris¹, Mr. Konstantinos Papadopoulos¹, Mr. Aristides Papadopoulos¹, Dr. Georgios Koukis¹

¹*1st Department of Surgery, Nikea General Hospital, Piraeus, Greece, Athens, Greece*

Keywords: Necrotizing fasciitis ; Fournier 's gangrene

Background

Fournier 's gangrene(FG) is a life-threatening rapidly progressing acute necrotizing soft tissue infection of the perineal, perianal and genital areas.The patients usually have multiple comorbidities.The mortality rate is high. FG constitutes a true surgical emergency.

Purpose

To examine and present the outcomes for the cases we treated in our department during a four-year study period.

Method

We conducted a retrospective review of patients with necrotizing fasciitis presenting between 2012 and 2016 , utilizing the electronic medical database of our department.

Results

Twelve patients were included in the study with a mean age of 58 years. Males (8/12) were more afflicted . Most of patients (9/12) had a predisposing factor (mainly diabetes, cardiac disorders, and obesity). The patients presented with complaints of fever, pain , swelling and signs of regional infection. All of the patients got aggressive treatment with adequate resuscitation and supportive care, initial empiric broad-spectrum antibiotic therapy and all of whom underwent prompt radical operative debridement. The infection was mainly polymicrobial. The average number of procedures needed to manage adequate surgical source control was 4,2. Diverting loop colostomy and negative pressure wound therapy were also required for 9 and 3 cases respectively. Complex reconstruction was necessary for 2 patients.The mean length of stay was 21 days. The complication rate was relatively high, most were major complications (acute renal insufficiency 4 , septic 3/cardiac 2/respiratory 4 complications, multi-organ dysfunction 2, 4 required intensive-care unit management and 4 died).

Discussion

The aggressive treatment and the principle of surgical source control remain critical keys in the management of FG. The approach should be multidisciplinary and the severity should not be underestimated. The disease remains devastating with high mortality and morbidity. Novel therapeutic strategies may assist in the therapeutic armamentarium.

28. Lumbar abscess from solitary diverticulum of sigmoid colon

Miss. Eirini Pantiora¹, Dr. Georgios Giokas¹, Mr. Dimitrios Massaras¹, Dr Nikolaos Dafnios¹, Dr Theodosios Theodosopoulos¹

¹*2nd Surgical Department, National And Kapodistrian University Of Athens, Athens, Greece*

Keywords: abscess, retroperitoneal, diverticulum

Introduction

Diverticular disease is often complicated by inflammation and subsequent abscess formation in the peritoneal cavity. A few cases have been reported when rupture of a diverticulum led to formation of a retroperitoneal abscess treated surgically.

Case presentation

A 53 year old female patient with a history of untreated type II diabetes presented with night fever accompanied with sweating to the Internal Medicine department. The patient had no known history of diverticular disease. Work up revealed increased inflammatory markers, blood and urine culture samples were sterile. Computed Tomography and Magnetic Resonance Imaging revealed a large mass with internal septae in contact with the psoas muscle, in the left retroperitoneal space. The patient was subjected to sigmoidectomy and primary anastomosis and drainage of the abscess. Culture samples from the abscess fluid were positive for *Klebsiella pneumoniae*. Histopathology report revealed a solitary diverticulum of sigmoid colon. Postoperative course was uneventful and the patient was discharged on the 6th postoperative day.

Discussion

Diverticular disease is common in people over 40 years of age and may evolve in diverticulitis, perforation, abscess formation and even fecal peritonitis. However, in certain cases complications from diverticular disease may manifest in an unusual manner, delaying the diagnosis and proper management.

Poster Session III

64. Released Mitochondrial DNA Following Intestinal Ischemia Reperfusion Induces the Inflammatory Response and Gut Barrier Dysfunction

Qiongyuan Hu¹, Jianan Ren¹, Xiuwen Wu¹

¹*1. Department of Surgery, Jinling Hospital, Medical School of Nanjing University, Nanjing, , China*

Background

Ischemia-reperfusion (I/R) injury is a challenging clinical problem, especially injuries involving the gastrointestinal tract. I/R injury to the intestinal epithelium occurs in trauma and shock, especially in infections that may induce hypoperfusion. Mitochondrial DNA (mtDNA) is released upon cell death and stress, and can induce the inflammatory response.

Hypothesis

We aimed to investigate the role of mtDNA in the pathogenesis of intestinal I/R and infections.

Methods

Twenty intra-abdominal infection (IAI) patients in the SICU were enrolled. Intestinal I/R model was established with clamping of the superior mesenteric artery, and IEC-6 cells were incubated under hypoxia/reoxygenation (H/R) conditions to simulate I/R injury.

Results

We first clinically explored the relationship between the circulatory mtDNA levels and ischemia injury, and evaluated the role of mtDNA in IAI patients. Correlation analysis showed that the plasma mtDNA level was correlated with the lactate concentration, and the mtDNA level was significantly elevated in IAI patients with SIRS than in those without SIRS (Figure 1). Using in vitro models, H/R up-regulated oxidative stress, disrupted mitochondrial activity and the mitochondrial membrane potential, induced apoptosis and elevated the mtDNA levels in the supernatant of intestinal epithelial cells (Figure 2), and the co-culture of mtDNA with human primary dendritic cells significantly elevated TLR9-MyD88 expression and enhanced the production of inflammatory cytokines and chemokines (Figure 3). MtDNA was also released in a mouse model of intestinal I/R and was associated with the increased secretion of inflammatory cytokines (Figure 4) and increased gut barrier injury compared with that of the sham group (Figure 5).

Conclusions

We concluded that mtDNA contributes to I/R injury and may serve as a biomarker of intestinal I/R. We further suggest that oxidized mtDNA originated from IECs during intestinal I/R exacerbates the acute proinflammatory process by eliciting the production of proinflammatory cytokines and chemokines.

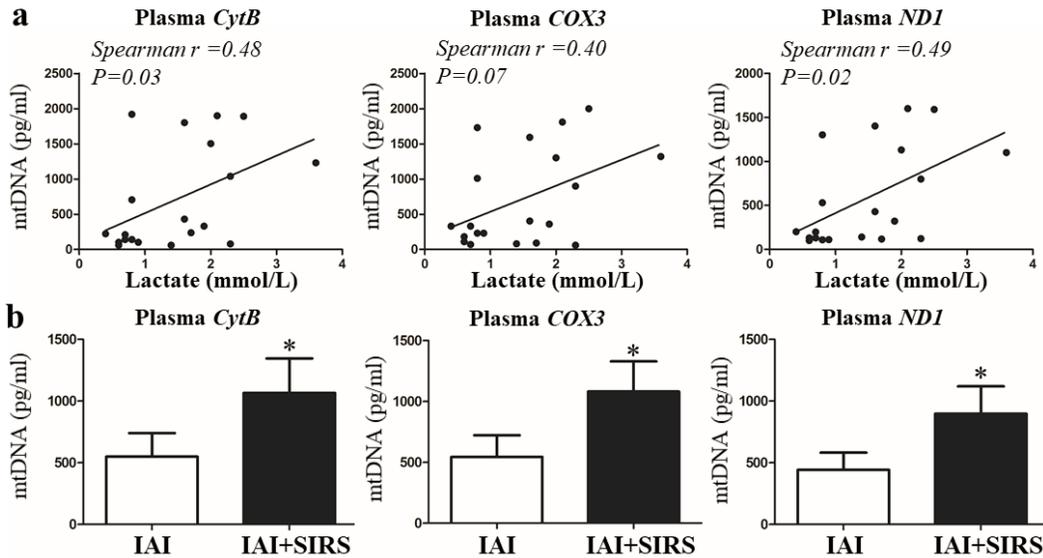


Figure 1 The plasma mtDNA level is increased in IAI patients and is correlated with the lactate level.

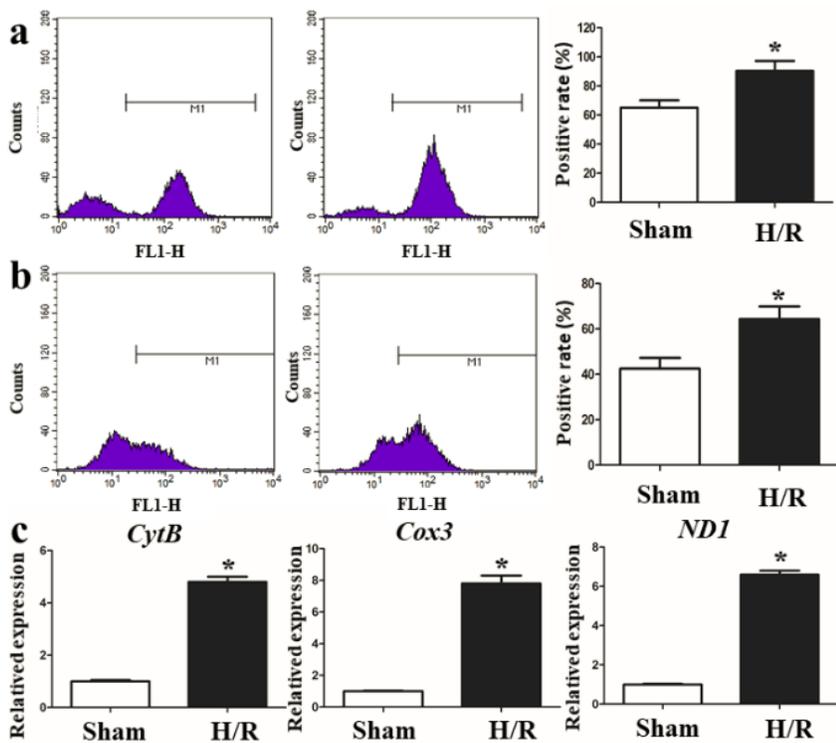


Figure 2: I/R elevates oxidative stress and mtDNA in vitro.

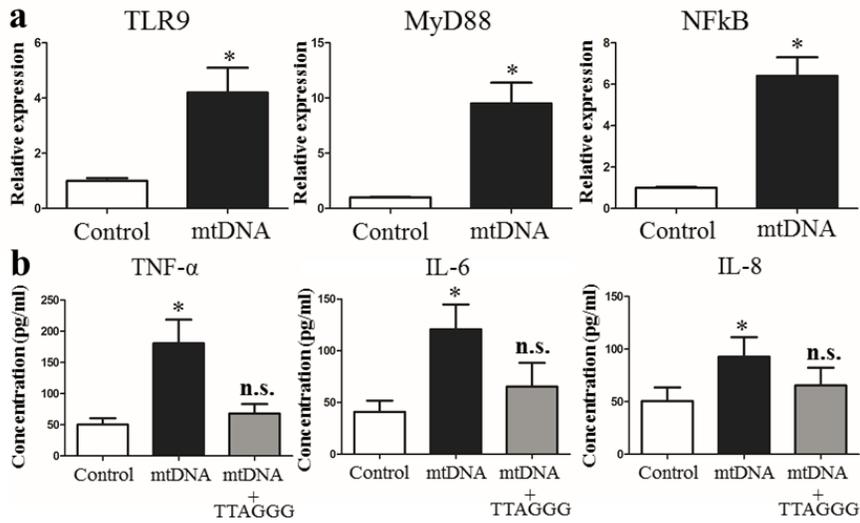


Figure 3. mtDNA induces pDC cell lines to up-regulate TLR9 expression and induced the inflammatory response.

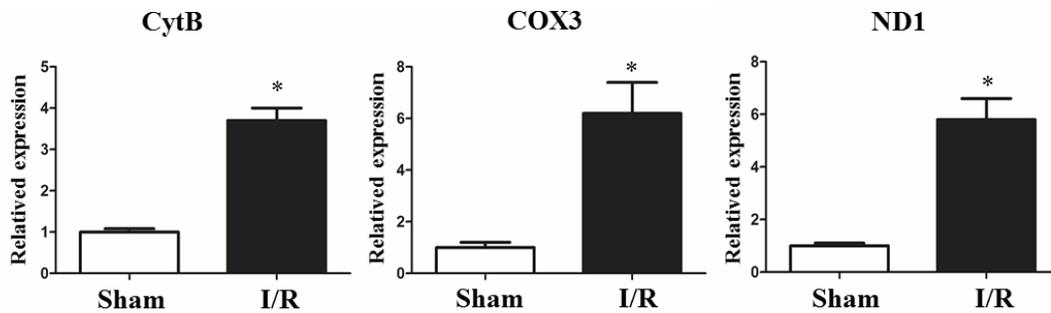


Figure 4. Intestinal I/R increases the mtDNA level in the circulation in vivo.

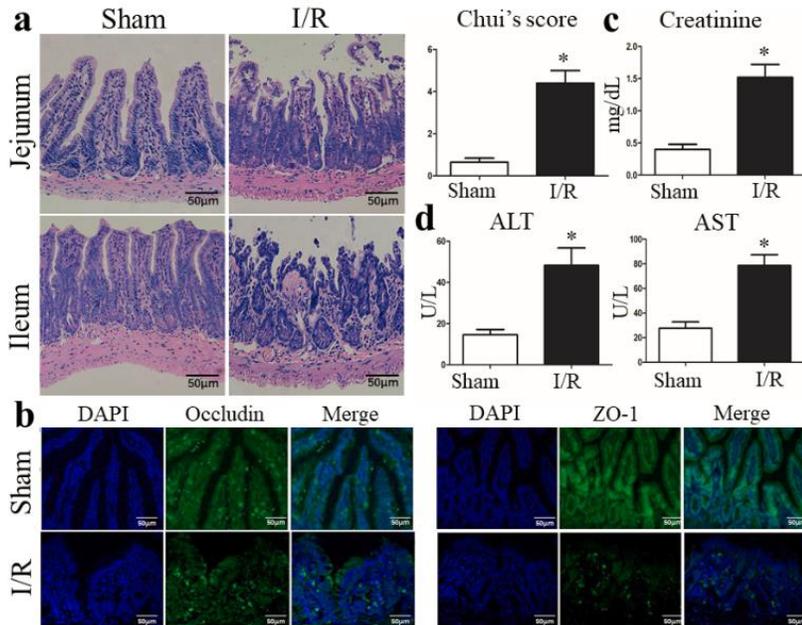


Figure 5. I/R triggers gut injury and intestinal barrier disruption.

27. Invasive Fungal Infection (IFI) as Diffused posttraumatic cutaneous mucormycosis in a multitrauma patient: Case report presentation

Dr. Vasileios Kaldis¹, Dr Aikaterini Tsatsaragkou¹, Dr Eleni Asimakopoulou¹, Dr Nikolaos Scoupas¹, Dr Emmanouil Skantzos¹, Dr Anastasia Spiropoulou², Dr Anastasios Dimas³, Dr Michele Guillaume - Vassilaki², Dr Agamemnon Kokofitis¹

¹Department of Surgery Panarkadikon General Hospital Of Tripoli, Greece, ²Department of Orthopaedics Panarkadikon General Hospital Of Tripoli, Greece, ³Intensive Care Unit Panarkadikon General Hospital Of Tripoli, Greece

Keywords: IFI, diffused cutaneous mucormycosis, trauma

Introduction

Diagnosing and treating fungal infections instaurated as mucormycosis is rare and difficult. The management thru antifungal therapy and surgical debridement, has a high fatality rate because of its rapid progression.

Methods

We present a 26-year-old male multinjured trauma patient admitted following a motor vehicle accident for blunt cerebral contusions, extended subcapsular liver haematoma and limps abrasions.

Results

6 yo past medical history of cerebral tumor treatment, after ICU admitting was instable underwent in exploratory laparotomy for intraabdominal hemorrhage. On ICU day 19 presented febrile status decided new exploratory laparotomy (relook). On day 22 & 23 the thigh abrasions presented necrotic so was decided the surgical debridement with large excision of the infected tissues. On day 30 cause limp jeopardy undergone in a new extensive surgical debridement, extending to healthy bleeding tissue followed by amputation. On day 31 were presented diffused small cutaneous ecchymotic lesion on his chest and torso, the abdomen trauma surgical site associated with surrounding erythema and edema. All the edges of the lesions became necrotic and surrounding erythema expanded in the next days. A white cotton-like appearance formed over the surgical wound. The fungal therapy was upgraded in the same day with liposomal amphotericin B at 5mg/kg/day. On day 36 the patient deceased.

Conclusion

There is the need to maintain high index of suspicion for mucormycosis. The proper antifungal therapy with an surgical debridement is the state of art with results in substantially better outcomes.

37. KERION CELSI. A VERY RARE FUNGAL INFECTION OF THE SCALP WHICH CAN IMITATE WOUND SUPPURATION

Mr. Andreas Rizos¹, MD MSc PhD FEBS Dimitris Papagoras¹, Mr Alexandros Barmpatis¹, Ms Xristina Psychou¹, Ms Maria Alexiou¹, Mr Christos Stragalis¹, Ms Maria Kanara¹, Mr Kostas Garoufas¹, Mr Christos Rammos¹, Mr Alexandros Korakis²

¹General Hospital Of Trikala, Surgery Department, Trikala, Greece, ²General Hospital Of Trikala, Aneesthesiology Department, Trikala, Greece

Keywords: Kerion Celsi, diagnostic pitfalls, wound suppuration

We present the case of a child patient, 13 years of age, son of stock farmers, who was treated in the pediatric department with the diagnosis of suppuration of a parietal scalp wound after injury (impact on the wooden lintel of the cane) ten days ago. He had fever and palpable cervical lymphnodes on the right lateral compartment of the neck. The child was referred to our hospital by a private dermatologist who had initially treated the lesion as a fungal infection with ointments. After shaving the head, we discovered a widespread painful swollen area studded with pustules and pus discharge from the wound, which was very sensitive to any effort of palpation (picture 1). Further clinical examination and evaluation were impossible due this severe pain and a MRI scan of the skull and brain was performed, which was negative for injuries of these deep structures, while a skin abscess cavity was found in the foremention area of alteration. The child was then subjected under general anesthesia to surgical drainage by of the pus which was then sent for culture along tissue samples for histology. Postoperatively, the fever ceased but there was no macroscopically improvement of the lesion and therefore a second dermatological consultation was ordered, which led to the diagnosis of kerion celsi and an oral fungicidal treatment was prescribed. Kerion celsi is an inflammatory form of tinea capitis caused by a T-cell-mediated hypersensitivity reaction to the causative dermatophyte. It is a very rare fungal infection which can imitate wound infection with suppuration resulting so in delay of treatment and therefore the involved clinician should always suspect this fungal infection in cases of a non typical scenario of wound contamination especially in body areas with low incidence rate of wound infection such as the skull and ask for consultation by an experienced dermatologist.

58. ULCUS PERFORATION AND CANDIDA PERITONITIS. THE IMPORTANCE OF AN EARLY SOURCE CONTROL AND DIRECTED THERAPY.

Begoña Peinado Iribar¹, Estibaliz Alvarez Peña¹, Arantxa Villadóniga Sanchez¹, Luis Asensio Gomez¹, Ines Rubio Pérez¹

¹Hospital Universitario La Paz, Madrid, Spain

Intra-abdominal candidiasis (IAC) is the second most common type of candidiasis. The prevalence of invasive fungal infections in patients undergoing surgery of the gastrointestinal tract has increased in recent years, but guidelines about antifungal empirical treatment in non-critically ill patients can be confusing due to heterogeneity of definitions and insufficient evidence. Limitations are associated with diagnostic methods, as the time lapse between fluid sampling and culture results can result in therapeutic delay, which significantly increases mortality in patients with *Candida* peritonitis. The decision for empirical antifungal treatment in any patient with suspected *Candida* peritonitis must be based on origin and type of infection, severity of disease, knowledge of patient-specific risk factors and previous exposure to antibiotics or azole antifungals.

A 39 year-old male presented to the Emergency Department with fever (38°C) and abdominal pain that had worsened in the last 6 days. He had a non-relevant medical history. Blood pressure was 120/70 mmHg, 126 bpm. He presented signs of peritoneal irritation on examination. Blood tests and cultures were extracted. He had a high CRP (526 mg/L), coagulation alterations (NRI 1,6), acute renal failure (Serum creatinine 2,53 mg/dL), no leukocytosis (neutrophils 81,6%), pH 7,2 and a lactate of 7 mmol/L. An early surgical consult was made, resuscitation with i.v fluids and a first dose of antibiotics was prescribed and a CT scan was performed. He was taken to the OR immediately. A gastric perforation with generalized peritonitis (more than 4L of purulent fluid) was identified in theatre. Primary closure of the perforation and abdominal lavage were performed, and two drains were placed. Abdominal fluid was sent for culture, and empirical treatment (Ertapenem and Fluconazole) was prescribed for his severe condition. He stayed 48 hours in ICU. On the fourth postoperative day he presented clinical worsening associated with leukocytosis and high CRP. Meropenem, Linezolid and Anidulafungine were prescribed and a CT scan was performed, informing about intense peritonitis. Surgical lavage was performed, with no other findings, and fluid was sent for culture again. A multidisciplinary team with ICU, Infectious Diseases and Surgery closely followed the case. Intraabdominal cultures were positive for *Candida albicans* sensitive to Fluconazole. Despite completing tailored antimicrobial and antifungal therapy and being clinically stable with no abdominal pain, fever persisted. Complete study for Infectious diseases, immunological conditions, parasites, etc. was performed (all negative). After discarding all possible origins, the altered immunological state was considered persistent SIRS, and under strict surveillance corticosteroid treatment was prescribed, with a favourable response. The patient could finally be discharged, with no other infectious complications. *Candida* peritonitis is increasing in frequency and is associated with well-defined risk factors, especially in patients with some kind of immune-suppression and upper-GI pathology. Postsurgical fungal infectious complications can be severe, so we need to be extremely aware of their clinical importance, because an early diagnosis and directed treatment are related with a better prognosis. Fluconazole is considered as appropriate empirical treatment in patients at risk for invasive *Candida* infections. Persistent SIRS after a severe infection must be considered when there has been an adequate source control and other possibilities have been ruled out, as we must be aware of the potential risks and negative effects of corticoid therapy in patients with infections.

10. Necrotizing fasciitis after inguinal hernia repair.

Dr. Christianna Oikonomou¹ Falidas Evangelos, Stavros Gourgiotis²

¹417NIMTS, Athens, Greece

²Addenbrooke's Hospital, Cambridge, UK.

Keywords: necrotizing fasciitis, hernia

Background

Necrotizing fasciitis (NF) represents a rare complication following inguinal hernia repair. It is a life threatening condition due to the rapid spread of a soft tissue infection in subcutaneous tissues and fascias. Systemic and local signs of important toxicity predominates patients' clinical course. Immunocompression or diabetes mellitus also may favor NF.

Materials-Methods

An 84-year old man underwent elective repair of a right inguinal hernia with mesh. His medical history included hypertension, benign prostate hypertrophy, hyperuricemia and hypothyroidism under medical treatment and operated abdominal aortic aneurysm ten years ago. The procedure was uneventful and he was discharged 24 hours after the operation. During his home recovery, only moderate pain and diarrhoea were reported. The seventh postoperative day, the patient visited our emergency department because of intense pain and swelling at the operation site. He also reported anorexia and malaise but no fever. On clinical examination, intense swelling, redness and small hematoma-like blisters on the skin around the operation site were observed. Laboratory examinations included moderate leukocytosis, elevated urea, transaminases and C-reactive protein. The scrotum was normal. Removal of the inferior left suture of the wound deliberated yellowish liquid. Cultures were taken and showed contamination with Meticillin resistant *S.epidermidis*. Ultrasound showed only moderate accumulation of liquid. We initially considered this clinical condition as a wound infection and the patient received empirical antibiotic treatment (clindamycin and ciprofloxacin). Twenty four hours later, the patient was febrile (38.8°C) and laboratory findings were worsening. Blood cultures were taken and the results were finally sterile.

Results

Large necrotic areas around the wound, blistering, crepitation and extended cellulitis were observed. The patient underwent abdominal computed tomography (CT) that demonstrated attenuation of the subcutaneous tissue, cellulitis and gas. Liquid was also seen around the mesh. Surgery was decided; large necrotic skin and subcutaneous tissue, scarpa and external oblique aponeurosis as well as mesh were removed. The wound was left opened.

Postoperatively, clinical condition was improved in 24 hours.

Vacuum assisted closure, was applied for one week (two sessions) with diminished negative pressure values (50-70 mmHg) in order to avoid re-herniation of the previously ligated hernia sac. Skin graft interposition was also performed. He was discharged the 20th postoperative day with no further complications.

Conclusions: NF represents a rare complication following inguinal hernia repair. Early recognition of NF and treatment is mandatory. Although extremely rare, NF should always be suspected in postoperative period of open or laparoscopic hernia repair and differentiated than cellulitis, seroma or simple wound infection. Aggressive resuscitation, antibiotics and removal of necrotic tissues are fundamental for the clinical improvement. Type of wound closure could be individualized.

11. *Dirofilaria immitis*: a rare cause of subcutaneous infection in an adult

Dr. Christianna Oikonomou¹ Falidas Evangelos, Stavros Gourgiotis²

¹417NIMTS, Athens, Greece

²Addenbrooke's Hospital, Cambridge, UK.

Keywords: *Dirofilaria immitis*, subcutaneous, PCR

Background

Human dirofilariasis is a zoonotic infection caused by one of the species of worms included in the genus *Dirofilaria*. Most reported cases involve *Dirofilaria repens* and rarely *Dirofilaria immitis*. Canines are the reservoir of the infection while human infections are sporadic. We herein report an extremely rare case of a subcutaneous trunk dirofilariasis in a 45-year-old immunosuppressed woman caused by *Dirofilaria immitis*. The diagnosis was established by the use of ultrasound and was confirmed by the PCR-based method.

Material-Methods

A 45-year-old woman was evaluated to outpatient clinic for a subcutaneous nodule. Her medical history included systemic lupus erythematosus (SLE) under steroids and pulmonary embolia under treatment with acenocumarol. She was working in a butcher's shop and had a family farmland with small animals and a domestic pet (dog). She observed an erythematous, painful, rigid, immobile, and inflamed subcostal nodule at the right hypochondrium. She received antibiotics with limited response. She underwent an ultrasound (US) that identified a mobile parasitic-like structure inside the abscess. After surgical removal of the nodule, a long yellowish-semitransparent thin filariform formation was appeared. The finding was collected but the optical microscopy was unable to characterize the organism.

Results

This material was identified through PCR amplification of a 12S rRNA gene fragment as *Dirofilaria immitis*. DNA extraction (Nucleospin®TissueKit) followed by panfilarial polymerase chain reaction (PCR) was performed. Extracted DNA was amplified by PCR using primers specific for the 12S rRNA region. The PCR products were compared with sequences deposited in GenBank. The sequences showed 100% similarity and 100% coverage with the 12S rRNA gene of the *D. immitis* and 90% similarity and 88% coverage with the 12S rRNA gene of the *D. repens*, and thus it was classified as *D. immitis*. The real-time PCR results were positive for *D. immitis* and negative for *D. repens*. These results confirmed the diagnosis of a *D. immitis* infection.

Conclusion: The *Dirofilaria* genus includes more than 40 species among them few may infect humans. Humans are the dead-end host, but they might acquire an infection with the bite of mosquitoes of the genera *Aedes*, *Culex* and *Anopheles*. Although *D. repens* is the main cause of dirofilariasis in South Europe, Asia and Africa, *D. immitis* is also rarely reported (30 cases) as cause of the disease. Surgical excision or biopsy may pose the final diagnosis. Eosinophilia, IgE elevation and histopathology are of limited value. Conclusive diagnosis may be done with PCR. Although infections due to *Dirofilaria* are rare, physicians should be aware in order to precisely identify the parasite, especially in geographic endemic areas. The use of the PCR-based method should be considered as a safe diagnostic technique for dirofilariasis.

44. NECROTIZING SOFT TISSUE INFECTIONS: A MINI-SERIES EXPERIENCE

Dr. Constantinos Avgoustou¹

¹General Hospital of N. Ionia "Constantopoulion-Aghia Olga-Patission", Athens, Greece

Key words: necrotising fasciitis, infection, surgery

Aim

Necrotizing Soft Tissue Infections (NSTI) are polymicrobial and synergistic infections, that are rapidly progressive, being life-threatening conditions.

Methods

During the period 11/2015-10/2017 we treated 5 men and 1 woman with NSTI, aged 35-75 years (mean:56.8). The site of infection was the perineum and genitalia in 2 patients, the lower extremities in 2, the upper extremity-thorax-dorsum in 1 and the gluteal area in 1. Comorbidities were encountered in 4 patients (diabetes mellitus:2, immune deficiency:2). Increased WBC count (except in immunodeficient patients) and CRP > 10 mg/L were constant laboratory findings. All patients underwent a CT scan at the site of the infection. All of them were urgently resuscitated and supported and were transferred to the operating room for emergent surgery. Broad-spectrum antibiotics were given.

Results

In all, an initial aggressive surgical debridement was achieved and samples from necrotic tissues and spillage or pus were given for histology and cultures. To halt infection, a single operation was adequate in 4 patients, while 2 others needed one and three wound revisions. One patient needed ICU support after index surgery for 3 days. Cultures from tissues and pus at index surgery revealed various microbial organisms, such as *Staphylococcus aureus* and *haemolyticus*, *Enterococcus avium*, *Klebsiella pneumoniae*, *Citrobacter freundii*, *Acinetobacter baumani* and *Escherichia coli*, sometimes in combinations. Antibiotic therapy was suitably arranged to further culture results, if required. All patients underwent reconstruction of surgical defects, either in the same admission or some weeks after discharge. Patients were hospitalized for 19-41 days (mean:33). No death was encountered.

Conclusions

NSTI require high index of suspicion for prompt diagnosis, urgent resuscitation and support, and emergent surgical debridement of necrotic/ischemic tissues. Repeated debridement if needed, daily wound care and suitable adjustment of antibiotics are essential to have a favorable outcome.



53. Microbiology of Necrotizing Soft Tissue Infections – Does it justify the initial empirical treatment?

Dr. Ioanna Pentara¹, Dr. Nikolaos Danias¹, Dr. Panteleimon Vasiliou¹, Dr. Georgios Konstantoudakis¹, Dr. Zisis Mantanis¹, Dr. Ioannis Margaritis¹, Dr. Athanasios Asonitis¹, Dr. Jonninda Selmani¹, Prof. Nikolaos Arkadopoulos¹, Prof. Iordanis Papadopoulos¹

¹*4th Surgical Unit of the University of Athens Medical School, ATTIKON University Hospital, Athens, Greece*

Keywords: soft tissue, necrotizing infection, microbiology

Background/Aim

Necrotizing Soft Tissue Infections (NSTIs) are either monobacterial or multibacterial. We retrospectively analyzed the data from patients with NSTIs addressed in our Unit during last year, in order to see if the empirical treatment was consistent with the results from tissue cultures.

Patients

During 2017, seven patients with severe NSTIs were treated in our Unit. In all patients, empirical broad-spectrum antibiotic treatment was initiated, followed by surgical debridement in the OR within the first 24 hours. Presence of one or more comorbid conditions (malignancy, diabetes mellitus, obesity, autoimmune disease) was observed in every patient. Cultures of tissue specimens were sent during operation in all cases.

Results

Vacuum Assisted Closure was applied in all cases and subsequent closure of the wound was feasible in six out of seven patients at a later stage. Culture results showed E Coli in three patients sensitive to most of the antibiotics, tigecycline sensitive Enterococcus faecium in one patient, VRE in one patient, multi-resistant Klebsiella and Acinetobacter in one patient and Acinetobacter sensitive to quinolones in one patient. Initial treatment was adequate in four patients (57.2%) and had to be escalated in three (42.8%). In one patient with prolonged (more than one month) hospital stay, the initial treatment had to be escalated as well, based on new tissue cultures. Mortality was 42.8% (3/7).

Conclusions

The treatment of NSTI is mainly surgical, irrespective of the specific type of infection and the causative microorganism. It is essential during the initial exploration, to remove aggressively not only the devitalized and infected tissues, but also all doubtful areas. Antibiotics are a necessary component of therapy, not for the necrotic tissues, but for the co-existing life-threatening bacteremia. Therefore, the administration of antibiotics should be initially empirical and, depending on the final culture results, be adjusted later. Bactericidal antibiotics, intravenously, in high doses and in combination should be used, as we can never be sure if the infection is monobacterial or multibacterial. This initial treatment is proved to be adequate in more than 50% of the cases.