

Session: P-28. Endocarditis

Background: Infectious endocarditis is associated with substantial in-patient mortality of 15-20%. Effective management requires coordination between multiple medical and surgical subspecialties which can often lead to disjointed care. Previous European studies have identified multidisciplinary endocarditis teams as a tool for reducing endocarditis mortality.

Methods: The University of Michigan Multidisciplinary Endocarditis Team was formed on May 3rd, 2018. The group developed an evidence-based algorithm for management of endocarditis that was used to provide recommendations for hospitalized patients over a 1-year period. Mortality outcomes were then retroactively assessed and compared to a historical control that was identified using an internal research tool.

Figure 1

Figure 2. Study enrollment flowchart

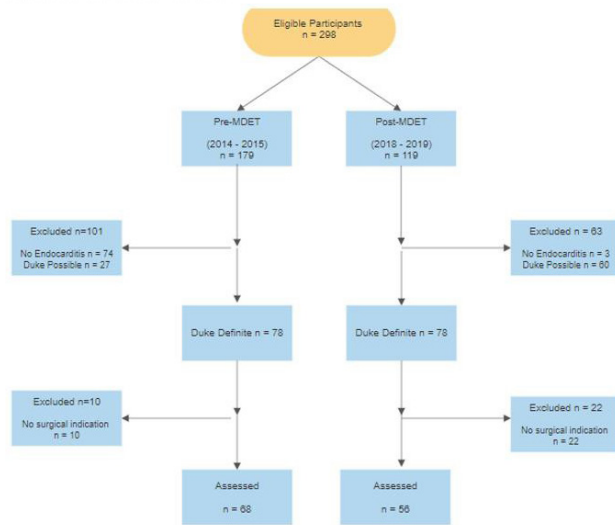


Table 1

Table 1. Characteristics of patients with definite and endocarditis and surgical indications in the period before (2014-2015) and after (2018-2019) implementation of the multidisciplinary endocarditis team. (Abbreviations: OSH = Outside Hospital), IV = Intravenous, ESRD = End-Stage Renal Disease, CIED = cardiac implantable electronic device, ICU = Intensive Care Unit, STS = Society of Thoracic Surgeons)

Variable	2014-2015 (n = 68)	2018-2019 (n = 56)	P-value
Average Age (years)	57.5	50.7	0.02
Male Gender, % (n)	60.3 (41)	62.5 (35)	0.80
OSH Transfers, % (n)	65.7 (44)	60.7 (34)	0.57
Average Days to Transfer	8.5	8.7	0.90
IV Drug Use, % (n)	14.7 (10)	14.3 (8)	0.95
Diabetes	26.5 (18)	16.1 (9)	0.16
ESRD	16.2 (11)	14.3 (8)	0.77
Acute Renal Failure	16.2 (11)	0 (0)	0.002
Prosthetic Valve, % (n)	51.5 (35)	28.6 (16)	0.01
Presence of CIED, % (n)	13.2 (9)	12.5 (7)	0.91
Aortic Valve Involvement	52.9 (39)	57.1 (32)	0.64
Mitral Valve Involvement	42.6 (29)	44.6 (25)	0.82
ICU Admission, % (n)	48.5 (33)	64.3 (36)	0.08
Vasopressor Requirement, % (n)	34.3 (23)	39.3 (22)	0.57
Mechanical ventilation, % (n)	29.9 (20)	55.4 (31)	0.004
Heart Failure from IE, % (n)	48.5 (33)	50.0 (28)	0.87
IE Complicated by Heart Block/Abscess, % (n)	26.5 (18)	23.2 (13)	0.67
Persistent Bacteremia, % (n)	7.4 (5)	16.1 (9)	0.13
Recurrent Emboli, % (n)	42.6 (29)	26.8 (15)	0.07
Vegetation >10 mm, % (n)	29.4 (20)	32.1 (18)	0.75
Mean STS Risk Score, %	11.8	9.8	0.40

Results: Between June 14th, 2018 and June 13th 2019 the team provided guideline-based recommendations on 56 patients with Duke Criteria definite endocarditis and at least 1 American Heart Association indication for surgery. The historical control included 68 patients with definite endocarditis and surgical indications admitted between July 1st, 2014 to June 30th, 2015. In-hospital mortality decreased significantly from 29.4% in 2014-2015 to 7.1% in 2018-2019 (p< 0.0001). There was a non-significant increase in the rate of surgical intervention after implementation of the team (41.2% vs 55.4%; p=0.12).

Table 2

Table 2. Microbiologic diagnoses for patients with definite endocarditis and surgical indications during the periods prior to and after implementation of the multidisciplinary endocarditis team. (Abbreviations: MSSA = Methicillin Susceptible *Staphylococcus aureus*, MRSA = Methicillin Resistant *Staphylococcus aureus*)

Microorganism	2014-2015 (n = 68)	2018-2019 (n = 56)	P-Value
MSSA, % (n)	14.7 (10)	26.8 (15)	0.10
MRSA, % (n)	10.3 (7)	10.7 (6)	0.94
Coagulase Negative <i>Staphylococcus</i> , % (n)	10.3 (7)	5.4 (3)	0.32
<i>Viridans Streptococcus</i> , % (n)	17.6 (12)	23.2 (13)	0.44
Group B <i>Streptococcus</i> , % (n)	4.4 (3)	5.4 (3)	0.80
<i>Enterococcus</i> , % (n)	10.3 (7)	10.7 (6)	0.94
Fungal, % (n)	10.3 (7)	1.8 (1)	0.06
Polymicrobial, % (n)	8.8 (6)	3.6 (2)	0.24
Culture Negative, % (n)	4.4 (3)	5.4 (3)	0.80
Other, % (n)	8.8 (6)	7.1 (4)	0.73

Table 3

Table 3. Clinical and mortality outcomes of patients in the periods prior to and after implementation of the multidisciplinary endocarditis team.

Variable	2014-2015	2018-2019	P-value
Documented Cardiac Surgery Consultation, % (n)	75 (51)	83.9 (47)	0.23
Patients Managed Surgically, % (n)	41.2 (28)	55.4 (31)	0.12
Average Time to Cardiac Surgery Consultation (days)	7.1	2	<0.0001
Average Time from Admission to Surgery (days)	14	11.4	0.29
Average length of stay (days)	18	24.7	0.03
Overall In-hospital mortality, % (n)	29.4 (20)	7.1 (4)	<0.0001
Medical Management In-Hospital Mortality, % (n)	45 (18)	16 (4)	0.02
Surgical Management In-Hospital Mortality, % (n)	7.1 (2)	0 (0)	0.13

Table 4

Table 4. Number and types of changes to patient care plans recommended by the Multidisciplinary Endocarditis Team. (Abbreviation: TEE = transesophageal echocardiography)

Change in Plan of Care	Proportion of case (n=56)
Any change	83.9 (47)
Change in antibiotic plan	62.5 (35)
Change in surgical planning	21.4 (12)
Recommended TEE	16.1 (9)
Recommended additional neurologic imaging	7.1 (4)
Recommended additional infectious work-up	7.1 (4)
Recommended other additional diagnostic imaging	23.2 (13)

Conclusion: Implementation of a multidisciplinary endocarditis team was associated with a significant 1-year decrease in all-cause in-hospital mortality for patients with definite endocarditis and surgical indications. In conjunction with previous studies demonstrating their effectiveness, this data supports that widespread adoption of endocarditis teams in North America has the potential to improve outcomes for this patient population.

Table 5

Table 5. Predictors of in-hospital mortality in patients with definite endocarditis and surgical indications in the years 2014-2015 and 2018-2019.

Variable	Estimate	Standard Error	Z-Value	P-Value
Age	-0.0237	0.018	-1.62	0.11
Gender	-1.055	0.582	-1.81	0.07
Diabetes	-1.210	0.572	-2.12	0.03
Prosthetic Valve	-0.754	0.526	-1.43	0.15
Heart Failure	-0.956	0.521	-1.83	0.07
Vasopressor	0.37	0.735	0.50	0.51
Mechanical Ventilation	-0.587	0.721	0.82	0.42
ICU Admission	-1.345	0.803	-1.68	0.09
Year	1.70	0.547	3.28	0.001

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714. Increase in Multidrug-resistant Salmonella Serotype I 4,[5],12:i:- Infections Linked to Pork—United States, 2009–2018

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Session: P-29. Enteric Infection

Background: *Salmonella enterica* I 4,[5],12:i:- is the 5th most common serotype causing clinical *Salmonella* infections in the United States. A strain with resistance to ampicillin, streptomycin, sulfamethoxazole, and tetracycline (ASSuT) has been linked to swine production in Europe and the United States. We reviewed U.S. surveillance data to describe clinical infections with antibiotic-resistant I 4,[5],12:i:-.

Methods: We reviewed data from CDC's National Antimicrobial Resistance Monitoring System (NARMS) from 2009–2018 to describe trends. We analyzed whole-genome sequence data in PulseNet, the molecular surveillance network for food-borne illness in the United States, from 2015–2018 to distinguish between strains of I 4,[5],12:i:- using core-genome multilocus sequence typing, and identified antibiotic resistance determinants (ARDs). We reviewed data from the Foodborne Disease Outbreak Surveillance System to identify foods associated with outbreaks during 2009–2018.

Results: From 2009–2013 to 2014–2018, I 4,[5],12:i:- increased as a proportion of nontyphoidal *Salmonella* isolates in NARMS from 4.3% to 5.0% (P=0.006), while I 4,[5],12:i:- resistant to ASSuT increased from 1.1% to 2.6% (P< 0.001). Of the 3,056 sequenced I 4,[5],12:i:- isolates in PulseNet, 2,105 (69%) were in a clade within 0–108 alleles of each other (ASSuT clade). Within this clade, 77% of isolates had ARDs conferring resistance to ASSuT, compared with 3% outside the clade. Isolates in the clade were also more likely than those outside the clade to have ARDs conferring decreased susceptibility to ciprofloxacin (13.1% vs. 5.2%, P< 0.001) and resistance to ceftriaxone (5.4% vs. 2.3%, P< 0.001). Among I 4,[5],12:i:- outbreaks with a single food source, those related to the ASSuT clade were more often linked to pork (10/15 [67%] vs. 1/5 [20%], P=0.07).

Conclusion: The increase in I 4,[5],12:i:- infections during 2009–2018 was likely driven by a clade of which most members had resistance to ASSuT, and many had decreased susceptibility to antibiotics used for empiric treatment. The association of this strain with outbreaks linked to pork suggests that measures to decrease carriage of *Salmonella* and selection for this strain in swine could prevent clinical infections with multidrug resistant *Salmonella* I 4,[5],12:i:-.

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715. A 79 year old Female with Bloody Diarrhea and Hypovolemic Shock: Keep the Differential Diagnosis Open

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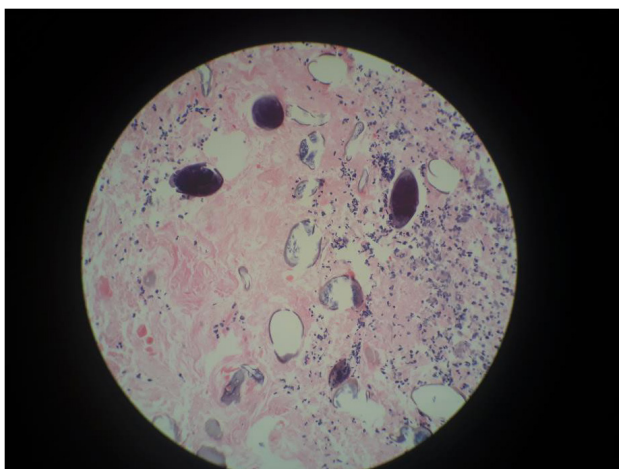
Session: P-29. Enteric Infection

Background: Schistosomiasis is considered one of the neglected tropical diseases which is rarely seen in USA. We are reporting herein a case of intestinal schistosomiasis presented as bloody diarrhea and hypovolemic shock at Monmouth Medical Center, New Jersey.

Methods: Case Report:

A 79 year old female presented with bleeding into her colostomy bag and associated left lower abdominal pain for one day duration. She has a history of colon cancer diagnosed 25years ago, which was treated with chemotherapy and a left hemicolectomy with colostomy formation. On admission, her blood pressure was 78/51 mm Hg. She looked pale and her abdominal examination revealed tenderness in left lower quadrant. Laboratory findings showed hemoglobin of 5.3 g/dl. CT abdomen showed extensive colitis. She was resuscitated and treated with Piperacillin-Tazobactam for 6 days with minimal improvement. Stool for ova and parasites were negative. EGD was unremarkable with no evidence of acute bleeding. Colonoscopy showed severe ulcerative colitis in the distal 30cm of colon. Pathology revealed ischemic and necrotic tissue with numerous calcified schistosoma eggs in the colon (Figure 1). After further questioning, the patient mentioned that she travelled to South China 8months prior to presentation. Patient was then treated with Praziquantel for one day for possible Schistosomiasis Japonicum, given the regional distribution. The patient showed marked clinical improvement and was discharged home later.

Figure 1: Histopathology image showing calcified schistosoma eggs in colon



Results: Intestinal Schistosomiasis is a parasitic disease which peaks at age 15–20yrs, older patients usually have less parasitic burden. Symptoms include diarrhea, abdominal pain, dyspepsia and malnutrition. Heavily infected patients can have hemorrhagic diarrhea, obstruction and ischemic colitis. Definitive diagnosis requires egg identification. Treatment is relatively safe and effective, especially in the developed countries where the resistance to Praziquantel (PZQ) has not been reported yet.

Conclusion: Even though the worms that cause the disease are not found in USA, this case highlights the importance of recognizing Schistosomiasis especially in New Jersey, due to the high traveling immigrant population, as early recognition and treatment reduces morbidity and mortality.

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716. A Case of Symptomatic Intestinal Spirochetosis

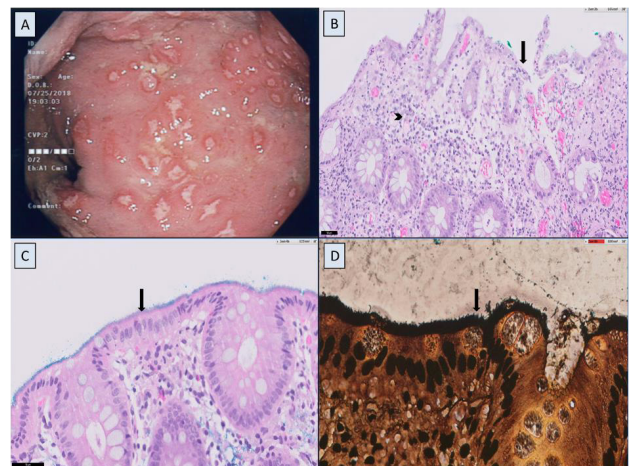
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Session: P-29. Enteric Infection

Background: Intestinal spirochetosis (IS) is a condition caused by *Brachyspira aalborgi* and *Brachyspira pilosicoli*. Its clinical significance has long been a point of contention with some debating that these spirochetes are simply colonic commensals. It is a condition that is more prevalent in developing nations as well as patients with HIV and the homosexual population. The epidemiology and prevalence of IS has not been studied in the local context.

Methods: We reviewed a case of a 37-year-old man who presented with a two month history of persistent lower abdominal pain, hematochezia, and increase in mucous discharge per rectum. He is sexually active with multiple male partners, and was previously treated for gonorrhea, chlamydia, and syphilis. His basic laboratory investigations were unremarkable, Venereal Disease Research Laboratory (VDRL) antibody and human immunodeficiency virus (HIV) screen were both non-reactive. Computed tomography of the abdomen was unremarkable. Endoscopic evaluation revealed multiple discrete ulcers measuring 1-2mm seen only in the rectum. Random biopsies of the cecum, ascending colon, transverse colon and descending colon showed mild acute colitis with IS. There was also mild to moderate acute proctitis in the rectum with spirochetes seen. 16S RNA gene sequencing of the biopsy specimen were confirmatory for *Brachyspira aalborgi*.

Investigation findings. A: Discrete Ulcers found in rectum, B: Hemotoxylin and Eosin stained specimen showing proctitis, C: False brush Border appearance D: Spirochetes on Warthin Starry stain



Results: The patient received a 10 day course of metronidazole with complete resolution of his symptoms.

Conclusion: This case demonstrates the existence of a treatable condition that can be diagnosed with current available investigations for patients with similar symptoms. Recognising at risk populations can also raise clinical suspicion for this condition. Some studies have found associations between IS with development of colonic polyps and also certain colorectal cancers. Further studies on this treatable condition and its disease burden in the local context should be further explored.

Disclosures: All Authors: No reported disclosures

717. Antibiotic treatment of Shiga toxin-producing Escherichia coli related gastroenteritis and the risk of hemolytic uremic syndrome: a population based matched case-control study in Japan

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Session: P-29. Enteric Infection