

13 – Gastrointestinal Disease: Clinical Syndromes

Speaker: Herbert Dupont, MD

IDBR
INFECTIOUS
DISEASE
BOARD REVIEW
LIVE VIRTUAL

AUGUST 19-23
2023

Gastrointestinal Disease: Clinical Syndromes

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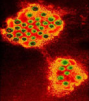
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Disclosures of Financial Relationships with Relevant Commercial Interests

- None

OBJECTIVES



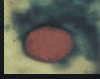
Noroviruses



E. coli



Shigella



Cyclospora

- DESCRIBE CLINICAL CHARACTERISTICS OF VARIOUS FORMS OF ENTERIC INFECTION SYNDROMES AND SEAFOOD-ASSOCIATED ILLNESSES
- OUTLINE METHODS EMPLOYED IN FOODBORNE OUTBREAK INVESTIGATION
- DEFINE THE COMPLICATIONS IN THERAPY OF TRAVELERS' DIARRHEA
- EXPLAIN THE IMPORTANT CHRONIC POST-ENTERIC INFECTION SYNDROMES
- EXPLAIN PRINCIPLES OF WORKUP OF PERSISTENT DIARRHEA FOR TREATABLE CAUSES

VOMITING AS THE PRIMARY SYMPTOM

- VIRAL GASTROENTERITIS WITH INCUBATION PERIOD: **24 – 48 HOURS**
(19-21 MILLION CASES/YEAR)
- FOOD POISONING PERFORMED TOXIN* OF STAPHYLOCOCCUS AUREUS **2-7 HOURS**
(240,000 CASES/YEAR)
- BACILLUS CEREUS WITH INCUBATION PERIOD: **2-7 HOURS**
(63,000 CASES/YEAR)



FOOD POISONING WITHOUT VOMITING

CLOSTRIDIUM PERFRINGENS FOOD POISONING PREFORMED TOXIN CAUSES

WATERY DIARRHEA WITHOUT VOMITING,

INCUBATION PERIOD OF **8-14 HOURS**
(1 MILLION CASES/YEAR)



FOOD POISONING FROM MARINE TOXINS



DINOFAGELLATES, A GROUP OF PHYTOPLANKTON, PRODUCE MARINE TOXINS THAT ARE EITHER INGESTED BY HERBIVOROUS FISH OR INGESTED AND CONCENTRATED IN FILTER-FEEDING BIVALVE MOLLUSKS

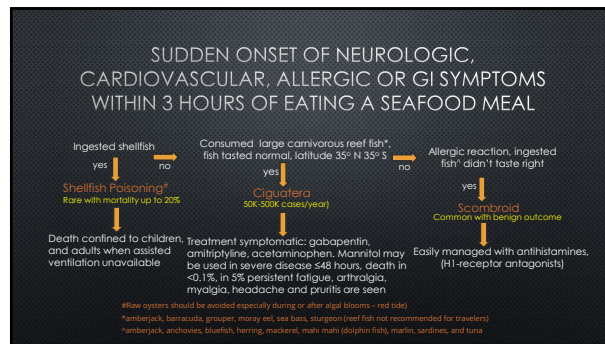


FISH THAT HAVE A HIGH AMOUNT OF HISTIDINE, A PRECURSOR OF HISTAMINE CAN LEAD TO EXCESSIVE LEVELS OF HISTAMINE AND AN ALLERGIC REACTION IF NOT PROPERLY REFRIGERATED AFTER HARVESTING

COOKING AND FREEZING DOES NOT INACTIVATE THE NEUROTOXIN OR HISTAMINE

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QUESTION #1 INFECTIOUS DISEASE BOARD REVIEW **2023** **PREVIEW QUESTION**

WHICH OF THE FOLLOWING IS THE MAJOR SOURCE OF SHIGATOXIN-PRODUCING *E. COLI* INFECTION?

- A. LEAFY GREEN VEGETABLES
- B. INCOMPLETELY COOKED BURGERS
- C. PETTING ZOOS
- D. UNPASTEURIZED FRUIT JUICES
- E. STEAKS NOT COMPLETELY COOKED



QUESTION #2



A PATIENT DEVELOPS NUMBNESS OF LIPS, BURNING AND TINGLING OF HIS EXTREMITIES, AND ABDOMINAL PAIN AND VOMITING 30 MINUTES AFTER A MEAL IN JAMAICA, PROGRESSING TO RESPIRATORY FAILURE.

WHAT IS THE LIKELY DIAGNOSIS?

- A. SCOMBROID
- B. PARALYTIC SHELLFISH POISONING
- C. CIGUATERA
- D. NEUROTOXIC SHELLFISH POISONING
- E. MONOSODIUM GLUTAMATE TOXICITY

QUESTION 3 INFECTIOUS DISEASE BOARD REVIEW **2023** **PREVIEW QUESTION**



A 65-YEAR OLD CHAIRMAN OF MEDICINE AT A MEDICAL SCHOOL WITH 15 DAYS OF DIARRHEA, PASSING 4-8 WATERY STOOLS PER DAY WITHOUT FEVER OR PASSAGE OF BLOODY STOOLS. HE HAS NOT TRAVELED AND HAD AN INITIAL WORKUP FOR DIARRHEA: STANDARD STOOL CULTURE AND AN ORDER FOR PARASITES THAT INCLUDES A SCREEN FOR *GIARDIA*, *CRYPTOSPORIDIUM* AND *ENTAMOEBAS*.

WHICH OF THE FOLLOWING IS THE BEST NEXT APPROACH?

- A. COLLECT 3 STOOLS FOR PARASITES BY EIA
- B. COLLECT 3 STOOLS FOR PARASITES BY PCR
- C. PERFORM MULTIPLEX PCR FOR ENTERIC VIRAL, BACTERIAL AND PARASITIC PATHOGENS
- D. ASK THE LABORATORY TO PERFORM ACID-FAST STAINING OF STOOL FOR PARASITES
- E. GIVE THE PATIENT 1,000 MG AZITHROMYCIN IN SINGLE DOSE

QUESTION #4 INFECTIOUS DISEASE BOARD REVIEW **2023** **PREVIEW QUESTION**



A 65-YEAR OLD CHAIRMAN OF MEDICINE AT A MEDICAL SCHOOL IN TEXAS WITH 15 DAYS OF DIARRHEA, PASSING 4-8 WATERY STOOLS PER DAY WITHOUT FEVER OR PASSAGE OF BLOODY STOOLS. HE HAS NOT TRAVELED AND HAD AN INITIAL WORKUP FOR DIARRHEA: STANDARD STOOL CULTURE AND AN ORDER FOR PARASITES THAT INCLUDES A SCREEN FOR *GIARDIA*, *CRYPTOSPORIDIUM* AND *ENTAMOEBAS*.

WHICH OF THE FOLLOWING IS THE BEST NEXT APPROACH?

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- D. ASK THE LABORATORY TO PERFORM ACID-FAST STAINING OF STOOL FOR PARASITES
- E. GIVE THE PATIENT 1,000 MG AZITHROMYCIN IN SINGLE DOSE

COMPLICATED CASE OF TRAVELERS' DIARRHEA

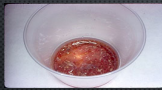



A 35-YEAR OLD WOMAN DEVELOPS DIARRHEA, CRAMPS AND IS PASSING BLOODY STOOLS WITH FEVER WHILE SNORKELING WITH HER FAMILY IN COZUMEL, MEXICO

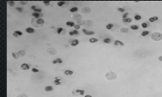
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QUESTION 4



Grossly bloody stool



Many leukocytes of stool microscopically indicate diffuse colonic inflammation

What is the preferred treatment for this patient With dysenteric traveler's diarrhea?

- A. AZITHROMYCIN 1,000 MG
- B. CIPROFLOXACIN 500 MG TWICE DAILY X 3 DAYS
- C. LEVOFLOXACIN 500 MG
- D. RIFAXIMIN 200 MG THREE TIMES/D FOR 3 DAYS
- E. ORAL FLUIDS ONLY

QUESTION 5

She takes three days of ciprofloxacin, a drug she has with her for recurrent urinary tract infection.

Which of the following concerns you the most about this treatment?



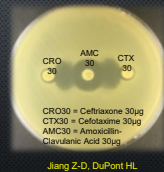
- A. COLONIZATION BY ESBL-PRODUCING COLIFORMS
- B. ACHILLES TENDON DAMAGE
- C. C. DIFFICILE INFECTION
- D. INSOMNIA AND IRRITABILITY
- E. SHE WILL RUN OUT OF DRUGS FOR FUTURE UTI

SCREENING FOR ESBL-PRODUCING COLIFORMS

ESBL or MDR Enterobacteriaceae Risk Factors:

- Travel to tropical and semitropical areas, especially Asia (highest for travel to India)
- Diarrhea increases rate and receipt of antibiotics further increases risk
- Endogenous Infections* or Spread to Family Duration of Colonization After Returning Home
- < 3 months to 12 months
- Shorter than when acquired in a hospital
- Treat only more severe Travelers' diarrhea

Extended spectrum beta lactamase-producing Enterobacteriaceae



Jiang Z-D, DuPont HL

POST-ENTERIC INFECTION DISORDER

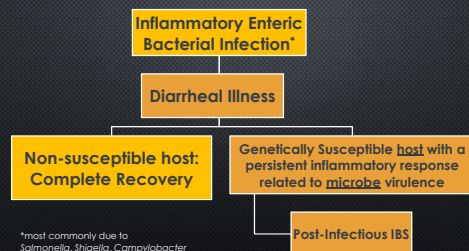
THE PATIENT EXPERIENCES A PROTRACTED COURSE



ABDOMINAL DISCOMFORT AND PAIN & BLOATING ARE NEAR CONSTANT PROBLEMS PRESENT 6 MONTHS LATER — SHE HAS NEVER BECOME WELL, ALTHOUGH THE ILLNESS HAS CHANGED IN CHARACTER FROM DIARRHEA TO ABDOMINAL DISCOMFORT WITH CHANGE IN BOWEL PATTERN (EATING INCREASES PAIN AND DECREASES STOOL FORM)

POST-INFECTIOUS IRRITABLE BOWEL SYNDROME 5-10% AFTER BACTERIAL DIARRHEA

PATHOGENESIS OF POST-INFECTIOUS IBS



POST-ENTERIC INFECTION DISORDER 2

QUESTION 6

Which one of the following represents an antibody-Mediated post- enteric autoimmune complication?

- A. CROHN'S DISEASE
- B. FUNCTIONAL CONSTIPATION
- C. REACTIVE ARTHRITIS
- D. CELIAC DISEASE
- E. WHIPPLE'S DISEASE

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Post-Enteric Infection Disorder 2

- REACTIVE ARTHRITIS AFTER INFECTION BY *SALMONELLA*, *SHIGELLA* OR *YERSINIA* DUE TO AUTOIMMUNE RESPONSES TARGETING EPITOPES COMMON TO PATHOGEN AND JOINT TISSUES



QUESTION 7

WHAT IS ANOTHER ANTIBODY-MEDIATED POST-ENTERIC INFECTION SYNDROME?

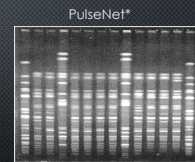
- A. ASEPTIC MENINGITIS
- B. GUILLAIN BARRÉ SYNDROME
- C. POST-INFECTIOUS IBS
- D. POST-INFECTIOUS INFLAMMATORY BOWEL DISEASE
- E. DIVERTICULITIS

OUTBREAK INVESTIGATIONS

STEPS
EPIDEMIC CURVE ESTABLISH AN OUTBREAK
CLINICAL FEATURES TO DEVELOP A CASE DEFINITION
INCUBATION PERIOD IN THE CASE OF A COMMON EXPOSURE
CASE-CONTROL STUDIES OF CAUSE

AN EPIDEMIC OF SHIGA-TOXIN (STX) PRODUCING *E. COLI* (STEC) O157:H7

- ON MAY 19, 2009, THE PULSENET NATIONAL MOLECULAR SUBTYPING NETWORK IDENTIFIED A CLUSTER OF 77 CASES OF *E. COLI* INFECTION FROM 30 STATES WITH IDENTICAL PFGE PATTERN
- CASES OCCURRED BETWEEN MARCH 1 AND JULY 31, 2009
- THE MEDIAN AGE WAS 15 YEARS, 71% WERE FEMALES
- 55% WERE HOSPITALIZED, 18% DEVELOPED HUS AND NONE DIED



Developed in 1996, two enzymes cut bacterial DNA with an electrical current moves DNA according to size showing unique banding patterns
PFGE being combined with WGS

CASE CONTROL STUDY PERFORMED TO IDENTIFY THE SOURCE

STEP 3: CASE CONTROL STUDY

- CONTROLS WERE FOUND FROM CORRESPONDING HEALTH DEPARTMENTS WITH NON-STEC ENTERIC INFECTION
- CONVENTIONAL STEC RISK FACTORS* WERE NOT FOUND

*Ground beef, raw dairy products, leafy green vegetables, wading pools and animal contact

CONVENTIONAL SOURCES RULED, LOOK FOR UNUSUAL EXPOSURES

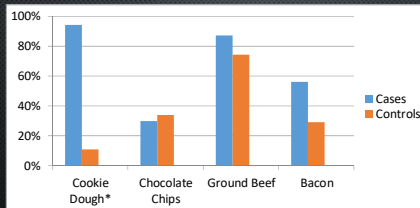
- OPENED QUESTIONS IN ONE HEALTH REGION FOUND 5/5 ATE READY-TO-BAKE COOKIE DOUGH

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A CASE CONTROL STUDY NOW COULD IDENTIFY THE SOURCE

STEP 2: OUTBREAK INVESTIGATION



53% of college student reported eating unbaked homemade cookie dough. Byrd-Bredbenner C et al. J Am Diet Assoc 2008;108:549-52

CONCLUSIONS PART 2

1. THE CLINICAL FEATURES AND INCUBATION PERIOD PROVIDE CLUES TO THE CAUSE OF ILLNESS
2. KNOW HOW TO DIAGNOSE STEC INFECTION (O157 & NON-O157)
3. MOLECULAR CHARACTERIZATION OF PATHOGENIC STRAINS (PULSENET), THE EPIDEMIC CURVE AND CASE CONTROL STUDY ARE KEYS TO FOODBORNE OUTBREAK INVESTIGATION
4. CONSIDER PLUS IN PERSONS WITH PERSISTENT ABDOMINAL PAIN AFTER FEBRILE OR DYSENTERIC DIARRHEA
5. LEARN SEAFOOD SYNDROMES
6. MULTIPLEX PCR WILL HELP DEFINE THE CAUSES OF DIARRHEA AND IS MOST VALUABLE IN WORKUP OF PERSISTENT DIARRHEA

