



NEWER INSIGHTS IN MANAGEMENT OF PERITONITIS

Surgery

Dilip Kumar Das	Associate Professor, Department of Surgery, RG Kar Medical College and Hospital, Kolkata.
Sudipta Samanta	Undergraduate student;RGkar Medical college
Agrima Mullick	Undergraduate student;RGkar Medical college
Anurag Sinha	MBBS, RMO, Department of Surgery, Sinha Nursing Home, Kishanganj
Mahua Roy Mondal	Assistant professor; Surgery.RGKar Medical college,Kolkata.
Ramanuj Mukherjee*	MSDNB MRCS MNAMS *Corresponding Author

KEYWORDS

Peritonitis

Peritonitis is Inflammation of the Parietal peritoneum lining the Coeliac cavity

Aetiology of Peritonitis:

1. Bacterial Peritonitis
2. Chemical Peritonitis
3. Allergic Peritonitis
4. Ischemic Peritonitis
5. Familial Mediterranean Fever

Acute Bacterial Peritonitis

Aetiology:

1. Gastro-Intestinal Cause:
 - E.coli
 - Aerobic and anaerobic streptococci
 - Staphylococcus
 - Clostridium welchii
 - Bacteroides
 - β Klebsiella
2. Non Gastro-Intestinal Cause:
 - Chlamydia
 - Gonococcus via Fallopian tube
 - Pneumococcus
 - Beta-haemolytic Streptococcus

Routes of Infections:

1. Gastro-Intestinal Perforation: Perforated duodenal ulcer, perforated colon, perforated appendix, Diverticular perforation
2. Transmural Translocation: Acute pancreatitis, Hemoperitoneum, Intraperitoneal rupture of bladder
3. Exogenous Contamination: Drains, open surgery, penetrating trauma
4. Female Genital Tract: Pelvic Inflammatory disease
5. Hematogenous spread: Septicemia.

Pathogenesis:

1. Lot of infected fluids are secreted causing shock and its sequelae.
2. Bowel gets adhered to each other containing fluid between each loop.
3. Thick flakes form adhered to bowel and bowel wall gets oedematous.
4. Peritoneum gets thickened, velvety, reddish, with loss of normal glistening appearance
5. Omentum becomes thickened and adherent
6. Pus may be present at sub-phrenic, paracolic, pelvic spaces.

Classification of Peritonitis:

Category	Classification	Description
Aetiology Specific	Primary	<ol style="list-style-type: none"> 1. No break in continuity of Gastro-intestinal tract 2. Hematogenous/ lymphatic seeding. Sometimes may be bacterial translocation is responsible 3. Monomicrobial in origin e.g. Streptococci or Gram negative Enterobacteriaceae.
	Secondary	<ol style="list-style-type: none"> 1. Severe inflammation of Gastro-intestinal tract. May be associated with macroscopic or microscopic perforation 2. Polymicrobial in origin. Aerobic gram negative bacilli, Gram positive cocci, Enteric anaerobes.
	Tertiary	<ol style="list-style-type: none"> 1. Recurrent or persistent peritoneal inflammation following initial treatment of secondary peritonitis. 2. Nosocomial organism e.g. Resistant gram negative bacilli, Enterococci, staphylococcus, yeast.
Extent of Inflammation	Localised	<ol style="list-style-type: none"> 1. Anatomically, favoured by different attachments of peritoneal folds. 2. Pathologically, <ul style="list-style-type: none"> • Greater omentum enveloping inflamed structure • Reduced peristalsis • Adhesions around gut loops adherent to one another and due to peritons due to fibrin deposition. 3. Fate: <ul style="list-style-type: none"> • Usually resolve with appropriate treatment • Abscess(20%) • Infrequently diffuse.
	Diffuse	<ol style="list-style-type: none"> 1. Factors favouring development of diffuse peritonitis <ul style="list-style-type: none"> • Speed of peritoneal inflammation (prime factor) • Stimulation of peristalsis • Virulence of infective organism • Young children • Rough handling • Immune deficiency 2. Fate: Under favourable circumstances it can become localised.

Clinical Presentation of Peritonitis:

Type of peritonitis	Clinical feature
1. Localised	1. Initial symptoms (due to visceral inflammation): <ul style="list-style-type: none"> • Diffuse pain and discomfort • Specific Gastro-intestinal symptom • Malaise, Anorexia, Nausea. 2. Due to involving overlying parietal peritoneum <ul style="list-style-type: none"> • Localised abdominal pain • Temperature and pulse rate increases • Localised guarding, Rebound tenderness, Localised rigidity are Pathognomic Signs. 3. Involvement of diaphragm: <ul style="list-style-type: none"> • Pain felt over tip of shoulder 4. Pelvic Peritonitis (involved pelvic appendicitis or salpingitis) <ul style="list-style-type: none"> • Deep tenderness on one or both lower quadrants • Tenderness on digital rectal examination or per-vaginal examination
2. Generalised	1. Early: <ul style="list-style-type: none"> • Severe pain abdomen which is made worse by coughing, movement, breathing. Patient takes a listless attitude. • Anorexia, Malaise, Fever, Lassitude • Nausea, vomiting • Pulse rate increase • Abdomen shows generalised tenderness, rebound tenderness, guarding, rigidity • Reduced or absent intestinal peristaltic sound. 2. Late: <ul style="list-style-type: none"> • Abdomen shows Card-board rigidity, increasingly distended and silent. • Circulatory failure is evidenced by cold and clammy extremity; dry tongue; irregular pulse; sunken eyes; drawn and anxious facies (Hippocratic Facies). • Finally lapses into unconsciousness • Rarely seen in modern surgical practice.

Investigations

- 1. Routine Blood Examination: Leucocytosis
 - Serum Amylase increases 4 times normal. Suggests acute pancreatitis.
- 2. Imaging:
 - Plain X-ray Chest (erect): Free Gas under diaphragm suggesting Gastro intestinal tract perforation
 - Y Lateral Decubitus Abdominal X-ray: Free gas under abdominal wall
 - Plain X-ray abdomen erect or supine posture: Ground glass appearance, multiple gas filled bowel loops are seen.
 - Y Multiplanar CT scan abdomen
 - USG
- 3. Invasive:
 - Peritoneal diagnostic tap or Four Quadrant tap with or without USG guidance.

Treatment:

- 1. General Care:
 - Correct fluid and electrolyte imbalance
 - Y Nasogastric tube
 - Urinary catheterization
 - Y Broad-spectrum antibiotic
 - Adequate analgesia
 - Y Vital system support
- 2. Specific treatment:
 - Y Remove cause
 - Peritoneal lavage with drainage

Complications:

- 1. Systemic:
 - Y Bacteraemic/ Endotoxic Shock

- Bronchopneumonia/ARDS/Respiratory failure
- Y Renal failure
- Bone marrow suppression
- Y SIRS and MODS
- Death
- 2. Local:
 - Adhesional Bowel obstruction
 - Y Paralytic ileus
 - Intraabdominal abscess
 - Y Pylephlebitis
 - Burst abdomen
 - Y Incisional Hernia

Prognosis:

With Modern treatment recent mortality due to generalised peritonitis is approx. 10%.

Biliary Peritonitis

Aetiology:

- 1. Perforated Cholecystitis
 - 2. Post-Cholecystectomy
 - Y Cystic duct stump leakage
 - Division of accessory bile duct at GB bed
 - Y Bile duct Injury
- 3. Following choledocholithotomy and T-Tube placement:
 - Y T-tube drain dislodgement and tract rupture on removal
- 4. Following other operations:
 - Y Post Gastrectomy duodenal stump leakage
 - Leaking Biliary-Enteric Anastomosis
 - Y Hepatic Trauma

Clinical Presentation:

- 1. Features of diffuse peritonitis unless bilioma forms
- 2. Jaundice may be present

Management:

- 1. Evacuation of bile
- 2. Peritoneal lavage with drain
- 3. Identification of source and treat accordingly.

Tuberculous Peritonitis

Source of infection:

- 1. Through Gastro-intestinal tract: At Ileo-colic region by mesenteric lymph nodes
- 2. Blood-borne: Miliary; sometimes may be cavitating
- 3. Tuberculous pyosalpinx

Clinical presentation:

- 1. Acute form: Acute bacterial peritonitis
- 2. Chronic form: abdominal pain, fever, loss of weight, ascites, night sweats, abdominal mass.

Types:

- 1. Wet type: Ascitic, Encysted
- 2. Fibrous (plastic)
- 3. Purulent

Diagnosis:

- 1. Abdominal USG or CT
- 2. Ascitic fluid exam:
 - Straw colored/ Protein more than 2.5gm/dL/ SAAG less than 1.1/ WBC more than 500/cumm (predominantly lymphocytes more than 40%)/ ADA more than 33U/L
 - Y Diagnostic smear for AFB: in less than 3% of cases
 - Culture for AFB: more than 4-8 weeks. No guarantee for positive result.
- 3. Laparoscopy with peritoneal /Lymph node biopsy: Diagnostic.

Management:

- 1. Principally supportive and medical.

2. Surgery for specific complication like Intestinal obstruction (may sometime respond to ATD without Surgery)

Familial Mediterranean Fever (Periodic Peritonitis)

Epidemiology:

1. Genetic and runs in families
2. Patients underwent appendectomy in childhood
3. Children usually affected
4. Common in Arabian, Jewish, American

Clinical Presentation:

1. Abdominal pain, tenderness; mild leucocytosis; pain thorax and joints.
2. Duration of attacks 24-48 hrs which then spontaneously remits followed by exacerbation.

Diagnosis:

On Laparotomy, peritoneum in vicinity of spleen and Gall-bladder inflamed but all other interior organs are normal.

Treatment:

Colchicine.

Pneumococcal Peritonitis

Types, Clinical presentation, Source of infection:

1.Primary :

- ÿ More common
- _ Undernourished girls aged 3-9 years
- ÿ Infection coming through vagina and fallopian tube
- _ Complicating as nephrotic syndrome or cirrhosis

2.Secondary:

- _ Patients always males
- ÿ Blood-borne infection
- _ Prior respiratory tract disease or middle ear disease present.

Spontaneous Bacterial Peritonitis

Aetiology:

Bacterial infection of ascitic fluid without any intraabdominal or surgically treatable source of infection.

1. Pathogen in adult: E.coli and Klebsiella Pneumoniae
2. Pathogen in children: Group A streptococcus, Staphylococcus aureus, Streptococcus pneumoniae.

Pathogenesis:

1. Bacterial translocation from Gastro-intestinal tract
2. Occurs in patient with Cirrhosis, Nephrotic Syndrome, Congestive Cardiac Failure.
3. Rare in patient containing high ascitic fluid protein e.g., Peritoneal Carcinomatosis.

Diagnosis:

Ascitic Fluid Analysis: >250 neutrophils/cumm in a clinical setting is consistent with diagnosis. (Abdominal pain/ fever/ Leucocytosis with low protein ascites).

Management:

Third generation cephalosporin.

Peritonitis Associated with Chronic Ambulatory Peritoneal Dialysis

- ÿ One of the most common complication
- _ Managed with intraperitoneal antibiotic (1st generation cephalosporin)
- _ Recurrent or persistent cases: Resumption of hemodialysis

Starch Peritonitis

- _ Starch powder used as lubricant in surgical gloves causes painful ascites in some starch sensitive patients.
- ÿ Since starch free surgical gloves are available widely now-a-days, the occurrence of this phenomenon is rare.