

9. BACTERIAL OPPORTUNISTIC INFECTIONS

9.1 *Streptococcus pneumoniae* (Pneumococcus)

Streptococcus pneumoniae is a gram positive coccus and is responsible for a large number of infections in both immune competent and immunosuppressed persons, including, pneumonia, septicaemia, meningitis, sinusitis and otitis media.

9.1.1 Pneumococcal pneumonia

Patients usually present with cough, fever, chest pain and dyspnoea. The onset is generally over 3 to 14 days. The diagnosis is made on the clinical finding of an area of consolidation in one or more lobes of the lungs. A chest x-ray will show the areas of consolidation if present. Sputum and blood cultures may be useful in isolating the organism and assessing the resistance of the organism to antibiotics. Patients should be admitted to hospital if they are very ill and have any of the following signs:

- Respiratory distress - respiratory rate more than 30/minute
- Cyanosis
- Tachycardia - Pulse greater than 125 /min
- Hypotension - systolic blood pressure less than 90mm Hg
- Temperature less than 35° C or more than 40° C
- Altered mental state

Management

Non-drug related treatment

- Bed rest
- Fluids - if hypotensive give fluids intravenously
- Nutritional advice
- Oxygen by face mask if patient is dyspnoeic

Drug related treatment

First line treatment

Treatment of lobar pneumonia						
Drugs	Codes	Dose	Route	Frequency	Duration	
Benzyl penicillin	C	V	2.5 Mu	IV	QID	7 days
OR						
Amoxycillin	B	V	500mg	PO	TID	7 days
OR						
Erythromycin	C	V	500mg	PO	QID	7 days

Second line treatment

Second line treatment of lobar pneumonia						
Drugs	Codes	Dose	Route	Frequency	Duration	
Doxycycline	C	V	100mg	PO	BID	7 – 10 days
OR						
Ceftriaxone	A	N	1 to 2g	IM	OD	7 – 10 days
OR						
Chloramphenicol	B	V	500mg	PO	QID	7 – 10 days

NOTE:

- Tuberculosis and *Pneumocystis pneumonia* should be kept in mind
- In the presence of septicaemia the dose of penicillin should be increased to 5Mu QID

9.1.2 Pneumococcal meningitis

S. pneumoniae is a common cause of meningitis and is not limited to persons with HIV infection. Affected patients usually present with headache, fever, neck stiffness, with or without altered level of consciousness. The illness develops over a period of 1 to 7 days. The diagnosis is made on clinical grounds and confirmed by the examination of the cerebrospinal fluid which shows polymorphonuclear leucocytes that appear in large numbers in the fluid. If there has been prior antibiotic treatment there may be a mixture

of polymorphs and mononuclear cells in the CSF. The protein content of the CSF will be elevated and the glucose level will be reduced. Microscopic examination of gram stained preparations of CSF may show gram-positive diplococci. The CSF should also be examined for cryptococci by India ink stain and for TB bacillus by Ziehl Nielsen stain. **SEE CHAPTER ON NEUROLOGIC MANIFESTATIONS.**

Management

Non-drug related treatment

- Patients who are unconscious or confused may require special care
- Intravenous fluids need to be given
- Blood slides should be examined for malaria parasites

Drug related treatment

First line treatment of pneumococcal meningitis

Treatment of pneumococcal meningitis						
Drugs	Codes		Dose	Route	Frequency	Duration
Benzyl penicillin	C	V	5 Mu	IV	QID	14 days
AND						
Chloramphenicol	B	V	500mg	IV	QID	14 days

If patient is not better in 5 days refer for investigations

Second line treatment of pneumococcal meningitis

Second line treatment of pneumococcal meningitis						
Drugs	Codes		Dose	Route	Frequency	Duration
Ceftriaxone	A	N	2g	IV	BID	14 days
AND						
Rifampicin	C	V	600mg	PO	BID	14 days

NOTE:

DO NOT PERFORM A LUMBAR PUNCTURE IF:

- There are focal neurologic signs and the patient is deeply unconscious
- There is a rapidly falling level of consciousness
- Fundoscopy shows papilloedema
- One pupil is large and not reacting to light
- If in these situations a CT scan is not available then a careful lumbar puncture should be performed

9.1.3 Pneumococcal septicaemia

S. pneumoniae can cause septicaemia in susceptible hosts. Patients are very ill and present with fever, tachycardia, hypotension, tachypnoea. Initially, the peripheries are warm but becoming cold as the disease progresses and hypoperfusion ensues. There may be pneumonia, oliguria, confusion or a reduced level of consciousness. The diagnosis is made on clinical grounds and upon the isolation of the organism from blood cultures.

Drug related treatment:

Treatment of pneumococcal septicaemia						
Drugs	Codes		Dose	Route	Frequency	Duration
Benzyl penicillin	C	V	5 Mu	IV	QID	14 days
AND						
Chloramphenicol	B	V	500mg	IV	QID	14 days
OR						
Ceftriaxone	A	N	2g	IV	BID	14 days

9.1.4 Sinusitis and otitis media

SEE CHAPTER ON OTOLOGIC MANIFESTATIONS.

9.2 Non-typhoid salmonellosis

Infection with non-typhoid salmonella species is much more frequent in HIV infected individuals. Organisms responsible for infection include:

- *Groups C, B, D, and G salmonellae*
- *Salmonella paratyphi*
- *Salmonella typhimurium*
- *Salmonella enteritidis*

Patients present with fever, enterocolitis, bacteraemia, enteric fever, localised infection outside of the gastrointestinal tract, weight loss and diarrhoea, and some patients become asymptomatic carriers of the infection. The organisms usually invade the gut mucosa and then disseminate into the systemic circulation via the lymphatics. Infection usually occurs as a result of ingestion of contaminated water or food, particularly infected poultry, eggs, meat and dairy products. Person to person transmission occurs via the faecal oral route. Animals may be the reservoirs of infection and household pets may harbour the infection.

The diagnosis is made upon the isolation of the organisms in blood, urine or stool cultures.

Management

Antibiotic treatment should be guided by sensitivity of the organism isolated. Various antimicrobials have been used with varying effect. These include, amoxicillin, chloramphenicol, nalidixic acid and cotrimoxazole. The aminoquinolones seem to be drugs with the best action against most salmonella species.

Treatment of non-typhoid salmonellosis						
Drugs	Codes	Dose	Route	Frequency	Duration	
Ciprofloxacin	A E	500mg	PO	BID	14 days	
OR						
Chloramphenicol	B V	500mg	PO	QID	14 days	
OR						
Norfloxacin	C V	400mg	PO	BID	14 days	
OR						
Ceftriaxone	A N	2g	IV	BID	14 days	

9.3 Bacillary Angiomatosis

Bacillary angiomatosis or bacillary peliosis is caused by *Bartonella henselae* and *B. quintana*, which can cause cat scratch fever and trench fever, respectively. They can also cause vascular proliferative lesions that can form in many different organs including lymph nodes, skin, GI tract, lungs, bone, blood, heart, spleen, bone marrow, liver and brain. Most of these problems are due to *B. henselae*. Liver lesions, or bacillary peliosis (BP) may be concomitant with other systemic manifestations or skin lesions. Dermatologic presentations are variable, from red, vascular lesions with smooth or friable surfaces, to cellulitic plaques, Kaposi's sarcoma-like lesions, dry scaly plaques on erythematous bases, or subcutaneous nodules. Lesions of bacillary angiomatosis (BA) may be chronic and present for up to a year. They can be differentiated from KS, since a collar of scale is usually present around the border of the BA lesion.

Skin lesions are usually tender and there may be fever, weight loss and abdominal pain. The patient may admit to having had exposure to cats and may or may not recall flea bites. Hepatosplenomegaly or anaemia may be present, in addition to or in absence of the skin lesions described above. BA or BP usually occur with CD4 counts <50, although cat-scratch fever may manifest in immunocompetent individuals. Heart murmurs may indicate endocarditis. In patients with these symptoms and/or signs, the following other conditions should be borne in mind:

- Kaposi's sarcoma
- Angiosarcoma
- Pyogenic granuloma
- Septicaemia of other aetiology

The diagnosis is made on biopsy and the organism may be isolated in special types of blood culture media.

Management

Treatment must be prolonged to reduce the risk of relapse, generally 12 weeks or more for skin manifestations alone.

For systemic manifestations, evaluate for hospitalization and consider longer course of treatment:

Treatment of bacillary angiomatosis						
Drugs	Codes		Dose	Route	Frequency	Duration
Clarithromycin	A	N	500mg	PO	BID	12 weeks
OR						
Azithromycin	A	N	250mg	PO	QID	12 weeks
OR						
Ciprofloxacin	A	E	500-750mg	PO	BID	12 weeks
OR						
Erythromycin	C	V	500mg	PO	QID	12 weeks
OR						
Doxycycline	C	V	100mg	PO	BID	12 weeks

NOTE:

- For seriously ill patients, hospitalise and start antibiotics intravenously. Rifampicin 300mg PO BID is usually added to their treatment regimen, although this may necessitate interruption of the antiretroviral regimen due to drug interactions.
- Relapsed patients are re-treated for 16 weeks or more.
- Medications must be taken for the full 12 (or more) weeks, and on schedule, in order to control the infection.
- After course of medication is complete, return for any recurrent symptoms such as fever or new lesion growth.
- Antiretroviral therapy may be added (if patient is not already on it, and is ready to try it) after continuing the antibiotics for 4 or 5 weeks.
- Careful flea control for pets will help prevent exposure to these infections.

9.4 Dermatologic staphylococcal infections

Staphylococcus aureus is the most common cause of bacterial skin infections in patients with HIV. Staphylococcal infection may present as bullous impetigo, cellulitis, folliculitis, hidradenitis suppurativa. Presentation and treatment are determined by the depth of the infection. Patients with HIV are at risk from superinfection and bacteraemia from infections that, in other patients, might be thought to be trivial. Hospital admission for IV antibiotic therapy is indicated when systemic toxicity accompanies a staphylococcal skin infection.

The patient complains of itchy rash and there is inflammation of the skin and subcutaneous tissue with or without pustules or abscesses. There may be fever if systemic spread has occurred.

Bullous impetigo: facial, groin or axillary superficial blisters or erosions, often with yellow crusts.

Ecthyma: a superficially ulcerated “punched out” or eroded lesion with an extremely adherent crust. A purulent layer of material can usually be found under the crust.

Folliculitis: follicular pustules (pruritic, often very painful lesions) are visible on the face, trunk, in the axillae or groin. A tiny central pustule may be visible when the skin is stretched, although sometimes lesions are almost urticarial. These may extend below the skin surface, forming abscesses, or in rare cases, large, violaceous hidradenitis-like plaques with pustules. Note that excoriations may obscure primary lesions.

Cellulitis: findings include swelling, tenderness, erythema and warmth of localized tissue, most commonly on the face and extremities. May be associated with other types of lesions.

Rule out other causes of skin ulcerations/eruptions such as:

- *Candida albicans*
- Cutaneous hypersensitivity reactions to drug therapy
- Streptococcal infection
- Deep vein thrombosis (DVT) in lower extremity cellulitis
- Kaposi's sarcoma

- Pyogenic granuloma
- Angiosarcoma
- Drug reaction

Diagnosis is usually made after isolating *Staphylococcus* from lesions. A microscopic examination of purulent material should be performed. Blood cultures should also be performed if bacteraemia is suspected.

Management

- Impetigo: Cloxacillin, 500mg PO QID for 7 - 14 days), or erythromycin, 500 mg PO QID for 7 - 14 days, may be given.
- Deeper or refractory/recurrent lesions: Add rifampicin, 600mg PO OD to above.
- Drain loculated abscesses and remove crusts on ecthymatous areas.
- Recurrent lesions may indicate nasal carriage, which can be treated with topical mupirocin or bacitracin ointment to anterior nares TID for 7 days.
- If extensive cellulitis is suspected, admit for inpatient IV antibiotic therapy.
- Wash area with antibacterial soaps.
- Impetigo is highly contagious. Avoid hand contact with lesions, and do not allow other people to touch the areas.
- If not improved in 3-5 days, return to clinic.

9.5 Mycobacterium avium complex

Disseminated Mycobacterium avium complex (DMAC) is an opportunistic infection caused by the Mycobacterium avium intracellulare (MAI) microorganism. These organisms occur worldwide, and have been isolated from soil, water, animals, birds and foods. The estimated prevalence of disseminated MAC disease is 15-25% of patients with advanced HIV infection; this epidemic has arisen concurrently with the AIDS epidemic.

Unlike *Mycobacterium tuberculosis*, DMAC results from primary infection with the organism, not reactivation. DMAC is diagnosed when the organism is isolated from blood, lymph nodes, bone marrow, or liver. While MAC colonization occurs in many patients, disseminated disease occurs late in HIV disease, contributing to general disability, cachexia and death.

The patient complains of one or more of the following symptoms: persistent fever, night sweats, weight loss, anorexia, chronic diarrhoea, weakness, fatigue, and/or abdominal pain. Often the patient has abdominal tenderness and hepatosplenomegaly.

To establish the diagnosis, *Mycobacterium avium* must be isolated from a normally sterile site. Biopsy of the lymph node, liver or bowel may establish the presence of DMAC.

Management

Clarithromycin 500mg PO BID, or azithromycin 500-600mg PO OD; **PLUS**
Ethambutol 15 mg/kg PO OD; **PLUS**
Rifabutin 300mg PO OD, or ciprofloxacin 750mg PO BID, or ofloxacin 400 mg PO BID

9.6 Tuberculosis

Follow the Zimbabwe National Guidelines on the Management of TB.