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Original Research Paper

Oral Pathology

LABORATORY DIAGNOSIS OF BACTERIAL INFECTION

Prokshitha S. D	UG
Sowmiya. S	UG
Srileka. S	UG
Dr. Sandhiya. M	UG, PG, Department of Oral and maxillofacial pathology.
Dr. Vinoth. K	Senior lecturer, Department of Oral and maxillofacial pathology.
Dr. Sathishkumar. M*	Head of the Department, Department of Oral and maxillofacial pathology. *Corresponding Author

ABSTRACT Bacterial infection has large impact on public health. Bacteria are transmitted through air water food or living vectors. So, these organisms can cause disease at any body site. Mode of transmission of the bacterial infections or by contact, airborne, droplet vectors and vehicular. Preventive measures include water treatment immunization of animals and humans' personal hygiene measures and safer sex practices. These measures have huge impact on birth and death rate. Bacterial resistance to antibiotics and their use is a growing concern among people.

KEYWORDS : Bacteria, oral lesions, gram-positive, gram-negative, culture, antibiotics.

INTRODUCTION:

Bacterial infection is primarily a clinical conception that may bear the use of probative bedside or laboratory tests to confirm or count.

There are two factors to confirm the opinion

- Systemic dysfunction or Inflammation
- Circular or direct substantiation of a compatible bacterial pathogen.

The description of bacterial infection, and assessing the need for antibiotic remedy, thus requires clinicians to combine symptoms and signs of inflammation with individual tests for direct or circular substantiation of a pathogen as a cause of the inflammation. Inflammation may be localised or affect in a systemic seditious response pattern (SIRS) (1,2). Sepsis refers to the presence of a SIRS response caused by presumed or verified infection. Also, the finding of nitrites on a urine dipstick in the absence of symptoms or urine leucocytes may suggest asymptomatic bacteriuria or bacterial impurity, but not infection. Certain pathogens, still, are pathological when detected from any point (3,4).

Tuberculosis

Oral Manifestation

Tuberculous lesions of the oral depression do, but are rare. The organisms are carried in the foam and enter the mucosal towel through a small break in the face, the organisms may be carried to the oral Akins by a haematogenous route, to be deposited in the submucosa, mucosa. Lesions of secondary tuberculosis may do at any point on the oral mucous membrane, lingo, palate, lips, buccal mucosa, gingiva, and frenula and beget painful ulcers. Occasional mucosal lesions show swelling, grainy, nodular, or fissured lesions, but no egregious clinical ulceration (5,6).

Figure 3: Gingival enlargement

Lab Diagnosis:

Latent tuberculosis and skin testing

The Capability of tuberculosis to infect a case and remain idle for numerous times before reactivation is a crucial handicap to the control and elimination of tuberculosis.

Failure to identify and treat latently infected individualities allows the chain of transmission to continue. Testing for idle tuberculosis has generally been done by health- care workers in the form of tuberculin skin testing (TST).

The wide use of BCG vaccine across countries prevents cross replying environmental antigen. The recent development of the ELISPOT assay which measures interferon product from whole blood or supplemental blood mononuclear cells (PBMC) stimulated with either purifies protein outgrowth (PPD) or further specific antigens has shown pledge as a test for quiescence. The QuantiFERON tuberculosis test, which uses PPD to stimulate whole blood, lately gained FDA blessing (7).

Treatment

Blotches is the internationally accepted treatment course for TB affected existent. Multiple medicine remedy is frequently recommended as M. tuberculosis mutates and repel single medicine remedy.

Isoniazid (INH) combined with the rifampicin for 9 months or INH, rifampicin and pyrazinamide for 2 months followed by INH and rifampicin for 4 months other medicines used are streptomycin and ethambutol (8).

Actinomycosis

INTRODUCTION:

Actinomycosis is an uncommon, contagious complaint in which bacteria spread from one part of the body to another through body Akins. Over time, it can affect in linked abscesses, pain, and inflammation.

It can affect the skin or deeper areas within the body and the blood. numerous people have actinomycosis bacteria in their body, but the bacteria generally stay in one place and do not spread to another place. However, after injury or trauma, the bacteria can move to other corridor, if damage occurs in the part of body around where the bacteria live (9).

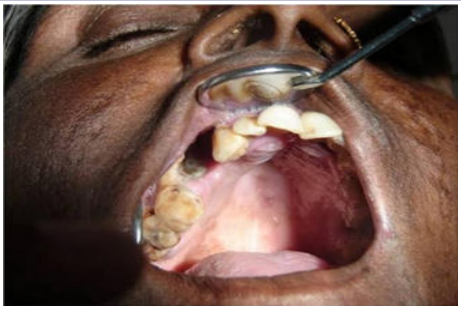

Fig:2.1 oral manifestation of actinomycosis

Lab Diagnosis:

To diagnose actinomycosis, a croaker may take a sample of foam, pus, or towel to shoot for bitsy disquisition in a laboratory. Occasionally, the laboratory will make a culture of the bacteria. However, the pus or towel will generally contain unheroic sulfur grains, If the infection is present. In some cases, the abscess may act a cancerous growth. Lesions in the lungs can beget symptoms like cancer or tuberculosis (TB). It is important to rule out other causes of analogous symptoms.

Treatment

Actinomycosis can persist for a long time so Long- term treatment needed with antibiotics, similar as penicillin, is common. It may last from 8 weeks to over 12 months. occasionally, a surgeon may drain an abscess or remove an infected part. After this, the person may need a 3- month course of antibiotics to get cure from the problem.

TETANUS

INTRODUCTION:

One of the acute bacterial infections is tetanus caused by Clostridium tetani which manifests as neuromuscular dysfunction. Tetani enters the body by external injuries defiled with spores set up in soils, or iatrogenic inoculation by surgical intervention.

Tetani produces a potent exotoxin, Tetanospasmin which binds irreversibly to the towel causing alcohol cadaverous muscle spasms and ferocious condensation ranging from trismus to opisthotonos. Infection of C. tetani due to dental procedures are rare and generally a history of external injury away in the body is associated with the same. Tetanus has been reported with tooth birth, RCT, gross decay, periodontal abscess, and intraoral soft towel trauma(fig:3.1). Tetanus remains common and is a significant cause of mortality.

Fig: 3.1 oral manifestation of Tetanus

LAB DIAGNOSIS:

opinion of Tetanus is grounded on clinical signs and symptoms. No Laboratory opinion is useful, as the bacterium that causes the complaint cannot be fully removed from the crack person who had tetanus before croakers diagnose tetanus grounded on a physical examination, vaccine and drug history, and the signs and symptoms of spasms in muscle, severity of muscle and pain.

Treatment:

There is no cure for tetanus. A tetanus infection requires long-term treatment and care while the complaint cures by its own. The treatments are wound care, specifics to ease symptoms and supportive care, generally in an ICU. Stomatitis scarlatina is top oral manifestation of scarlet fever. In hard and soft palate and uvula there is an appearance of small punctuate red macules called forchheimer spots. White coating and fungi appear on the lingo that form papillae are oedematous and hyperaemic as small red clods called strawberry lingo.

Scarlet Fever

Lab Diagnosis:

The complete blood cell (CBC) count reveals a leucocytosis. The white blood cell (WBC) count in scarlet fever may increase to 12,000- 16,000/ mcl, with a differential of over to 95 polymorphonuclear leukocytes (21). A rapid-fire antigen discovery test (RADT) or throat culture used by a clinician to confirm scarlet fever with pharyngitis. Throat culture is the standard individual test. should swab the tonsils and reverse of the throat to collect material that may have the strep bacteria (24,25). A rapid-fire strep test can identify the bacteria snappily. Pronounced leucocytosis with increased neutrophilia done through routine blood examinations. ESR and c reactive protein is elevated. The opinion is vindicated by cultivating the leafage of intraoral lesions, pharynx, and saliva (23). Serologic testing seeks validation of the antibodies that the body produces against the streptococcal infection, including anti-streptolysin-O and anti-deoxyribonuclease B are the antibodies that the body produces against the streptococcal infection.

Treatment:

Scarlet fever has no for entailment. Penicillin, dicloxacillin are the antibiotics that help in controlling complications (28). Cases who are antipathetic to penicillin may take erythromycin. Use ibuprofen or acetaminophen to control the fever and throat pain (26,27).

LEPROSY

Oral Manifestation:

One of the oldest and neglected conditions is leprosy (12). Which is habitual contagious complaint caused by tenon-cultivable bacillus Mycobacterium leprae. the oral lesions are generally small tumour like millions called lipomas which develop on the lingo, lips, or hard palate (fig 4.1). It has a great tendency to break down and ulcerate gingival hyperplasia which results in mobile tooth.

Fig:4.1 oral manifestation of leprosy

Laboratory Diagnosis:

Laboratory test alone is not enough for diagnose of leprosy. Clinical data analogous as evaluation of skin perceptivity and histamine or pilocarpine testing, generally conclude the opinion. Electroneuromyography and imaging tests, analogous as simple radiography, scintigraphy, ultrasound, reckoned tomography, and glamorous resonance imaging may help in opinion of supplemental neural involvement and

dissection, thus assuming great significance in cases of neuritis and primary neural leprosy, for disquisition purposes new tools are available which includes serological tests with the phenolic glycolipid 1 antigen (PGL- 1) and protein antigens; immunohistochemical response with antibodies against bacillus Calmette- Guerin (BCG), PGL- 1 and S- 100 protein; polymerase chain response (PCR) with several primers aiming at different genomic targets of M. leprae has. The disquisition is to identify molecular markers specific for M. leprae and laboratory tests to be done to diagnose asymptomatic cases or those with numerous symptoms and to predict complaint progression among exposed individualities and help leprosy transmission (13).

Treatment:

Long term chemotherapy is given upon opinion of leprosy. Treatment of leprosy is cured by using drugs, they are Dapsone, clofazimine, Rifampicin. For PB cases the duration of treatment is 6 months and for MB cases 12 months demanded (14).

Gonorrhoea

Oral Manifestation:

Extra genital gonorrhoea infection of oral cavity is being seen with increasing frequency. Occurs because of oral genital contact or inoculation through infected hands. Other well honoured legends gonococcal pharyngitis and tonsillitis. Transmission by fomite is rare. It is like oral lesions of erythema multiforme (41).

Fig: 5.1 lesions of erythema multiforme

Laboratory Diagnosis:

In males with urethral discharge a gram stain of the Purulent material can be used to demonstrate Gram Negative diplococcus within the neutrophils. Confirmation of the diagnosis is recommended by culture of endocervical swabs. Nucleic acid amplification test amplifies and abate and Gonorrhoea specific DNA or RNA sequences and are recommended for the diagnosis when conditions are not adequate to maintain the viability of the organisms. Inspite of availability of NAAT culture remains the preferred diagnosis of oropharyngeal infections. Thayer Martin media, Stuart or Armies media are used for Gonorrhoea. Samples can be collected with Dacron or rayon swabs. Diagnosis may be confirmed with positive fluorescent antibody test.

Treatment:

Cephalosporin is thought sufficiently efficacious by the CDC. In addition, coinfection by chlamydia trachomatis is common. Prophylactic ophthalmic erythromycin, tetra cycling or silver nitrate is applied to the newborn's eyes to prevent the occurrence of gonococcal ophthalmia neonatorum.

SYPHILIS

ORAL MANIFESTATION:

In primary stage of Acquired syphilis lesions occur on lips palate, gingiva, and tonsils. The lesions on lip may have a brownish crystal appearance. Lesions of secondary stage involves the drunk face and extremities result in pink to red macules and papules. The oral lesions called mucus patches are multiple painless Greyish white plaques. They occur most frequently on tongue, gingiva, or buccal mucosa (fig.1,3). Condylomatalata is a form of cutaneous manifestations course in secondary stage. Secondary syphilis can be present as an explosive and widespread form known as lues malign. The intra oral gamma in tertiary syphilis most commonly involves tongue and palate. In syphilitic glossitis the surface of the tongue gets broken up by fissures due to an atrophy and hyperkeratosis. In congenital syphilis the lesion includes frontal bossing, short maxilla, high palatal arch, saddle nose, mulberry molars (31,32).

Laboratory Diagnosis:

opinion of syphilis can be verified by demonstrating helical organism by vivisection or dark field examination of a smear of an active lesion (33). Using specific immunofluorescent recent antibodies nucleic acid modification testing are synthetic serologic evaluation. Oral occupants similar as treponema micro dentium, T. macrodentium and T. mucosum, false positive results in smears are possible in the oral depression. VDRL and RPR Are several non-specific and not largely sensitive serologic webbing tests for syphilis. All pregnant woman should admit one of the non-specific webbing tests. Because these tests are negative in the early primary stage. These tests are falsely negative in immunosuppressed cases (34,35).

Figure 1. Erythematous lesions in the palate region.

Figure 3. Labial mucosa lesion.

Treatment

The treatment of choice is penicillin. the cure and administration schedules veritably according to stage, neurologic involvement (36). A single cure of parenteral long amusement benzathine penicillin G is given for primary, secondary and early idle syphilis. For late latent or tertiary syphilis intramuscular penicillin is administered daily for 3 weeks.

CONCLUSION

The study exfoliate light on a generally overlooked aspect of case findings that is the information process to the bacterial infections. Besides test and elaborate disquisition athletes must use combination of clinical signs to diagnose a bacterial infection. So, the below information gives you the knowledge of types of tests available and how to use them duly are important instructions in perfecting cases issues and rational antibiotic prescribing(40).

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