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Research Article

FOR A HEALTHIER BABY, ASK YOUR DOCTOR ABOUT STD TESTING

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A B S T R A C T

"CDC study says at least 1 in 4 teen girls has a sexually transmitted disease.15-24-year-olds account for half of all new STD infections**.** A venereal disease is a contagious disease that is typically acquired in sexual intercourse. VDs affect men and women of all backgrounds and economic level. VDs may not cause symptoms. A person who is infected may not know it and may give the infection to a sex partner. Men who have sex with men have higher rates of STDs. It is sexually transmitted disease; HPV most common.VDs cause more severe health problems for women, such as death from a tubal pregnancy and cancer of the cervix. VDs can spread from a pregnant mother to her newborn baby and cause serious problems or death.

INTRODUCTION

Many sexually transmitted diseases (STDs) are caused by harmful bacteria. These infections aren't associated with any symptoms but cause serious damage to the reproductive system. (1) Chlamydia causes infection in men and women. Chlamydia increases the risk of pelvic inflammatory disease (PID) in women. Primary lesion appears on external genitalia. Gonorrhea, also known as "clap" and "the drip," is caused by Neisseria gonorrhoeae. It starts as acute urethritis with mucopurulent discharge and women with increases the risk of pelvic inflammatory disease (PID). Syphilis is caused by Treponema pallidum. It causes congenital syphilis. In acquired syphilis, produce a chancre.

Trichomoniasis is Trichomonas vaginalis. It inhabits the vagina of women and causes vaginitis (2). The disease is characterized by inflammation of vaginal mucosa, burning sensation, annoying itch, foul smelling vaginal discharges. Transmission of the parasite is always during sexual intercourse by male members who act as intermediaries. T. vaginalis is also found in the urinary tract of men infecting the urethra and prostate Toxoplasmosis is caused by a sporozoan parasite, Toxoplasma gondii.

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Human infection of Toxoplasma gondii has been reported from European countries, Middle East, Sri Lanka, the U.S.A, Australia, Hawaii and many other places. (3).It causes hydrocephalus and chorioretinitis. Infection is occurring in early months of pregnancy results either in abortion or still birth of the fetus.

Mycoplasma genitalium is an important sexually transmitted pathogen. Men infected with M. genitalium frequently present with dysuria, while women may present with or without urogenital symptoms. In some populations, M. genitalium is significantly associated with HIV-1 infection, and is also an etiological agent in pelvic inflammatory disease. However, there is insufficient evidence to establish a causative role of the organism in obstetric complications, including tubal factor infertility. (4) Gardnerella vaginal-is is a gram-ve bacteria found in vaginal region.It causes burning pruritis(Itching) of labia,dysurea. It increases vaginal discharge with fishy odor. *G. vaginalis* is associated with bacterial vaginosis,(5) which may be asymptomatic,(6) or may have symptoms including vaginal discharge, vaginal irritation, and a "fish-like" odor.

Urea plasma Produce non-urethrococcal urethritis in men and postpartum fever and chorioretinitis in women It had also been associated with a number of diseases in humans, including nonspecific urethritis, and infertility. (7,8 Infection in the newborn is accompanied by a strong immune response and is correlated with the need for prolonged mechanical

ventilation.(9,10)Infection with *U. urealyticum* in pregnancy and birth can be complicated by chorioamnionitis, stillbirth, premature birth, and, in the perinatal period, pneumonia, bronchopulmonary dysplasia and meningitis.(11) *U. urealyticum* has been found to be present in amniotic fluid in women who have had a premature birth with intact fetal membranes.(12) Haemophilus ducreyie is an opportunistic microorganism that infects its host by way of breaks in the skin or epidermis. Inflammation then takes place as the area of infection is inundated with lymphocytes, macrophages, and granulocytes. This pyogenic inflammation causes regional lymphadenitis in the sexually transmitted disease chancroid.(13) Candida albicans, men can become infected after having sex with a woman that has an existing vaginal yeast infection.(14) Parts of the body that are commonly infected include the skin, genitals, throat, mouth, and blood.(15) Distinguishing features of vaginal infection include discharge, and dry and red appearance of vaginal mucosa or skin. *Candida* continues to be the fourth most commonly isolated organism in bloodstream infections.(16,)It causes vulvo vaginal candidiasis. It is a common clinical syndrome often seen in STD clinics This causes itching and burning pain of the vulva and vagina, accompanied by white discharge that is usevally thick and curd-like. .Herpes simplex -2 causes multiple recurrent painful vesicular lesions in the genital area (genital tract lesions) and produce local pain, itching, fever. malaise and myalgia. Vesiculo ulcerate lesions in vagina, vulva, cervix, penis and painful. Neonatal herpes in infants, if untreated, the infection leads to CNS. High mortality rate. Human papilloma virus causes anogenital warts (Condylomata acuminata). Laryngeal papillomas in infants and sexually active people. Lesions appear around the external genitalia, on the cervix, inside the urethra or vagina Human cytomegalo virus produce most common intrauterine viral infection. It is most common infection in neonates in US. It causes mononucleosis syndrome, hearing defects, thrombocytopenia, hemolytic anemia. It causes various degrees of damage to liver, spleen, blood forming organs. It also produce mental retardation or fetal death.

History and Mechanism

The scientific study of viruses and the infections they cause - began in the closing years of the 19th century. Although Louis Pasteur and Edward Jenner developed the first vaccines to protect against viral infections, they did not know that viruses existed. The first evidence of the existence of viruses came from experiments with filters that had pores small enough to retain bacteria. In 1892, Dmitry Ivanovsky used one of these filters to show that sap from a diseased tobacco plant remained infectious to healthy tobacco plants despite having been filtered. Martinus Beijerinck called the filtered, infectious substance a "virus" and this discovery is considered to be the beginning of virology.

Louis Pasteur (1822 -1895) was unable to find a causative agent for rabies and speculated about a pathogen too small to be detected using a microscope.In 1884, Dmitry Ivanovsky (1864 -1920) studied tobacco mosaic virus. Paul Frosch (1860 -1928) discovered the cause of foot-and-mouth disease.

Ernst Ruska (1906-1988) and Max Knoll (1887-1969), that virus particles, especially bacteriophages, were shown to have complex structures. Viruses were expected to be small, but the range of sizes came as a surprise. Some were only a little smaller than the smallest known bacteria, and the smaller viruses were of similar sizes to complex organic molecules.

Significant Gap

Accuracy, Precision, Sensitivity, and Specificity. Accuracy describes how close the obtained results are to those obtained with the reference method and it is expressed as a percentage of correct results. *Precision* refers to the reliable reproduction of one test on the same sample and obtaining similar results. NAAT-Amplification and detection of sequences from the viral genome (DNA or RNA) RT-PCR, Immunoassay (Formation of Antigen and Antibody through recognition and binding RIA, EIA, NGS (Polymerisation of DNA templet by incorporation of labeled dNTPs.Ionisation and separation and detection of particles (35)

Major Advances and Discoveries

The morphological and physical characterization of viral particles provides only a basic knowledge about these intracellular pathogens (17). Hence, these techniques largely fail in identifying a molecular signature for viruses. As mentioned above viral genome possesses a great level of plasticity, and hence molecular identifications are essential to developing diagnostics (18). The molecular diagnosis also depends on the biochemistry of viral genetic material. The DNA and RNA viruses are entirely different in their genome and flow of their genetic information (19). Hence, it's very difficult to develop a common diagnostic for both the category. The nature of viral capsid is also an important parameter in developing diagnostics as each class of viruses' possesses different pattern and nature of protein expressing on the surface of viruses (20). Addition to molecular diagnosis, genome itself is being used as a potential target for the development of diagnostic devices. Now a day's genome sequencing and sequencing-based diagnostic devices are common not only in case of virus infection but also microbial infection as well. The genomic sequence-based diagnostics are accurate and effective and provide in-depth knowledge and information of pathogen (21). There are several variants in genomic-based diagnostics using PCR and Real-time PCR based technologies for the determination of viral load in the infected cell (22).

Ideas Where the Research Go Next

The microscopic and antibodies based assays are key diagnostic methods under conventional approaches (23). These approaches are effective and reliable in preliminary identification of viral infections and also act base for molecular and other advanced diagnostics (24).

Throughout the history of clinical diagnosis, microscopy remains a major analytical tool in biology and medical applications. The use of microscopy is versatile and had a wide range spectrum in microscopic examination of the virus and other microscopic pathogens associated with human diseases (25) Light microscope are used for preliminary studies (26).

The raised antigens are conjugated with fluorescent tags and allow a reaction with virus-infected cells (27).

Electron microscopy is one of a most powerful microscopic tool for the microscopic organism and virus diagnosis. There is two major variants in electron microscopy one scanning electron microscopy (SEM) and second transmission

electron microscopy (TEM). It detects virus particle, which is further characterized by their size and morphology (28).

Serological procedure for the laboratory diagnosis of Viruses help us to know the diagnosis. A rise in antibody titer to the virus can be used to diagnose viral infection. If the antibody titer in the convalescent phase serum sample is at least four-fold higher than the titer in the acute phase serum sample, the patient is considered to be infected (29). For the diagnosis of Hepatitis virus infection, HBsAg (Hepatitis viral surface antigen) or HBeAg (Hepatitis virus e antigens) can be detected (30). Detection of viral nucleic acids is one of the sensitive and rapid methods for the laboratory diagnosis of the virus (31). It requires the use of PCR (polymerase chain reaction) to amplify the viral genome present in the sample (32). The growth of virus in the cell culture may produce a characteristic cytopathic effect (CPE) which helps us for presumptive diagnosis (33) It can be detected Immunofluorescence assay, Radioimmunoassay, Hemadsorption, decrease in acid production of infected cells, ELISA, Complement fixation, Neutralization, etc (34).

Current Debate

The clinical diagnosis is a first and most crucial step in the process of finding therapeutics for a disease. There are several approaches are being used in clinical diagnosis including routine laboratory tests as conventional methods and also rapid and robust modern methods. Both the approaches have their significance in the clinical diagnosis of a disease. The conventional approaches largely depend on microscopy and staining of microorganism responsible for disease while modern methods are based on molecular signature and findings. In 19 the current scenario, there is a need for rapid and robust diagnostics as global disease burden is prevailing. At the same time, there is the continuous emergence of new and complex infectious pathogens, and hence early diagnosis provides ease in disease management. Recently, use of nanotechnology and enzyme-based diagnostic became popular and shown satisfactory results. The use of diagnostic become an integral part of modern medicine and involves molecular biology and cutting-edge bio-engineering as well. The integration of information technology in diagnostic is an added advantage to minimize time and ensure precise data interpretation.

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