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Tuberculosis Literature Review On Individual, Pregnant Woman, Pseudotumoral Abdominal And Association In Breast Cancer In Bangladesh

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Abstract
Tuberculosis continues to be a global public health issue, and its impact on pregnant women and their infants is particularly significant. In this case, we present the story of a 22-year-old woman who went into preterm labor at 32 weeks gestation. Throughout her pregnancy, she experienced complications such as hearing loss and weight loss. Upon delivery, she was diagnosed with tuberculous otitis media and disseminated tuberculosis [1]. Tuberculous otitis media is a rare form of tuberculosis that had serious consequences for both the mother and the infant in this instance. We report two cases of infiltrating carcinoma of the nonspecific type of the breast in two women aged 35 and 55 where tuberculosis was found in the axillary lymph nodes in addition to metastases. As the present case led to the fortuitous discovery of tuberculosis with tumor metastasis, it reinforces the possibility of a coexisting lesion in the minds of pathologists, especially in areas endemic to tuberculosis. This case underscores the importance of considering tuberculosis as a potential diagnosis in patients who present with atypical symptoms but have an epidemiological history that aligns with the disease [2]. Tuberculosis is a prevalent infectious disease worldwide, with approximately nine million new cases reported each year. Alarmingly, two-thirds of these cases occur in individuals between the ages of 15 and 64, which includes women of childbearing age. Pregnant women are particularly vulnerable to developing active tuberculosis due to their decreased cellular immunity during pregnancy. The diagnosis of tuberculosis can be challenging in pregnant women due to their compromised immune systems and the disease's tendency to manifest in atypical extrapulmonary forms. Studies have shown that up to 52% of pregnant women with tuberculosis exhibit extrapulmonary manifestations. It is crucial to recognize that in pregnant women, both the mother and the fetus are at risk. Although the exact risk of transmission to the fetus or newborn remains uncertain, a prompt diagnosis is essential to initiate effective and timely antimicrobial treatment [3]. GeneXpert MTB/RIF assay is a high detection rate of pulmonary tuberculosis and multidrug-resistant tuberculosis. This case report highlights the complexities involved in diagnosing tuberculosis and emphasizes the importance of being aware of the rare forms of the disease in patients with an epidemiological background consistent with tuberculosis in Bangladesh.

Keywords: *Tuberculosis, Tuberculous Otitis Media, Neonate, Pediatric Tuberculosis*

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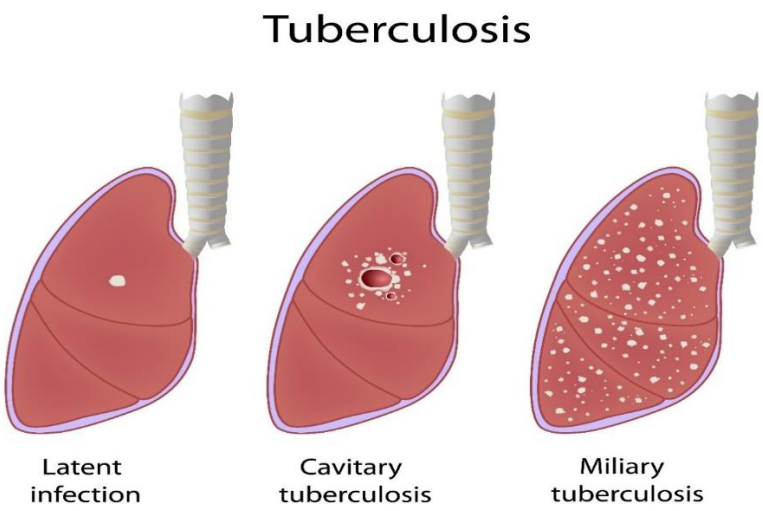
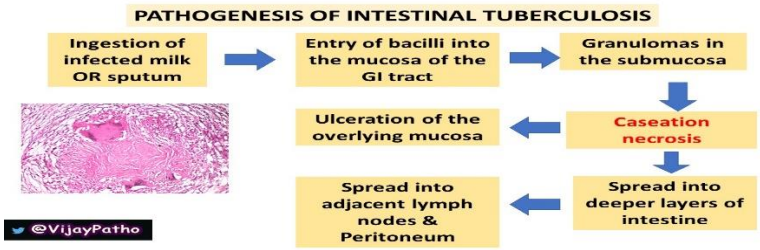
I. Introduction:

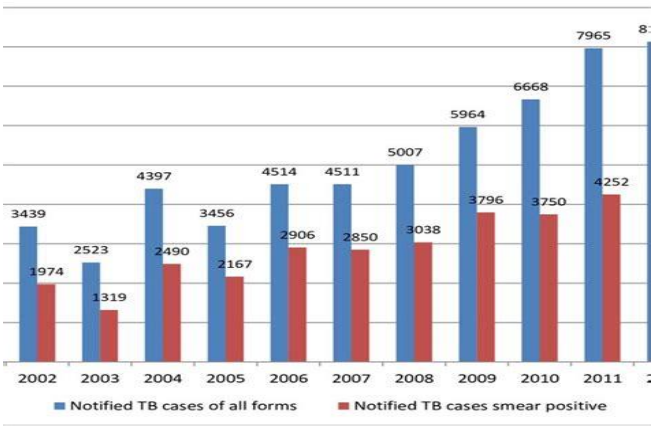
Tuberculosis continues to be a global public health issue, and its impact on pregnant women and their infants is particularly significant. In this case, we present the story of a 22-year-old woman who went into preterm labor at 32 weeks gestation.



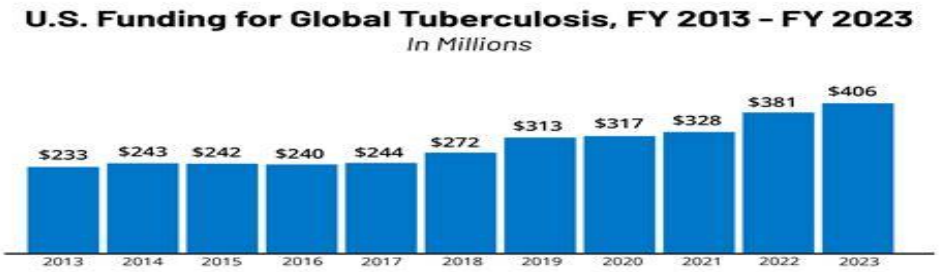
Cations such as hearing loss and weight loss. Upon delivery, she was diagnosed with tuberculous otitis media and disseminated tuberculosis. Tuberculous otitis media is a rare form of tuberculosis that had serious consequences for both the mother and the infant in this instance. This case underscores the importance of considering tuberculosis as a potential diagnosis in patients who present with atypical symptoms but have an epidemiological history that aligns with the disease. Tuberculosis is a prevalent infectious disease worldwide, with approximately nine million new cases reported each year. Alarmingly, two-thirds of these cases occur in individuals between the ages of 15 and 64, which includes women of childbearing age [4]. Pregnant women are particularly vulnerable to developing active tuberculosis due to their decreased cellular immunity during pregnancy.



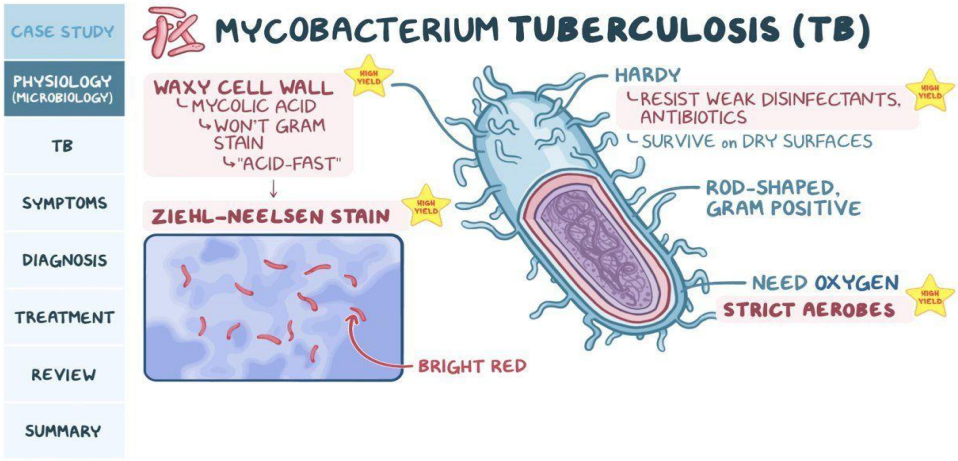
The diagnosis of tuberculosis can be challenging in pregnant women due to their compromised immune system and the disease's tendency to manifest in atypical extrapulmonary forms. In fact, studies have shown that up to 52% of pregnant women with tuberculosis exhibit extrapulmonary manifestations. It is crucial to recognize that in pregnant women, both the mother and the fetus are at risk. Although the exact risk of transmission to the fetus or newborn remains uncertain, a prompt diagnosis is essential to initiate effective and timely an



Timicrobial treatment. This case report highlights the complexities involved in diagnosing tuberculosis and emphasizes the importance of being aware of the rare forms of the disease in patients with an epidemiological background consistent with tuberculosis[5]. Only a tiny portion of individuals with chronic otitis (0.9%) have tuberculous otitis media (TOM) [2]. A number of factors contribute to the difficulty in diagnosing this illness, including low prevalence, which lowers the index of suspicion, clinical signs that deviate from the classic description, infrequent

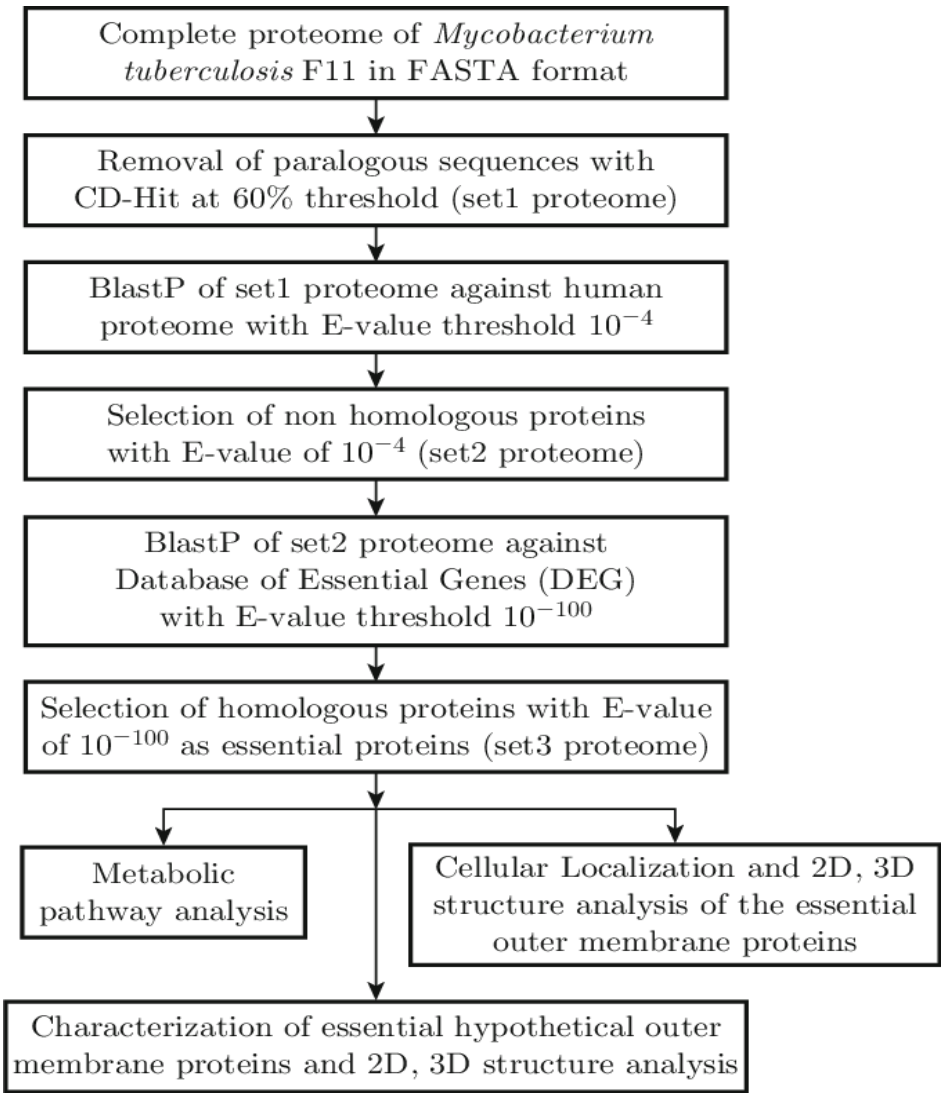


associations with other systemic involvement, and false-negative cultures because Mycobacterium tuberculosis is a fussy species [3]. On the other hand, irreversible hearing loss may result from failing to diagnose and treat this sickness [3] [4]. Moreover, misdiagnosing tuberculosis in a pregnant patient like the one mentioned here might make birth and the early years of the baby's life more difficult [1]. [5] through [7]. There has been discussion on the pathophysiology of TOM. There are three suggested processes that extend to the middle ear.



When in the lungs, *M. tuberculosis* is phagocytosed by alveolar macrophages, but they are unable to kill and digest the bacterium. Its cell wall is made of cord factor glycolipids that inhibit the fusion of the phagosome with the lysosome, which contains a host of antibacterial factors. Specifically, *M. tuberculosis* blocks the bridging molecule, early endosomal autoantigen 1 (EEA1); however, this blockade does not prevent fusion of vesicles filled with nutrients. In addition, production of the diterpene isotuber culosinol prevents maturation of the phagosome[13]. The bacteria also evades macrophage-killing by neutralizing reactive nitrogen intermediates. More recently, *M. tuberculosis* has been shown to secrete and cover itself in 1-tuberculosinyladenosine (1-TbAd), a special nucleoside that acts as an antacid, allowing it to neutralize pH and induce swelling in lysosomes. In *M. tuberculosis* infections, PPM1A levels were found to be upregulated, and this, in turn, would impact the normal apoptotic response of macrophages to clear pathogens, as PPM1A is involved in the intrinsic and extrinsic apoptotic pathways[14]. Hence, when PPM1A levels were increased, the expression of it inhibits the two apoptotic pathways. With kinome analysis, the JNK/AP-1 signalling pathway was found to be a downstream effector that PPM1A has a part to play in, and the apoptotic pathway in macrophages are controlled in this manner. As a result of having apoptosis being suppressed, it provides *M. tuberculosis* with a safe replicative niche, and so the bacteria are able to maintain a latent state for a prolonged time. The ability to construct *M. tuberculosis* mutants and test individual gene products for specific functions has significantly advanced the understanding of its pathogenesis and virulence factors. Many secreted and exported proteins are

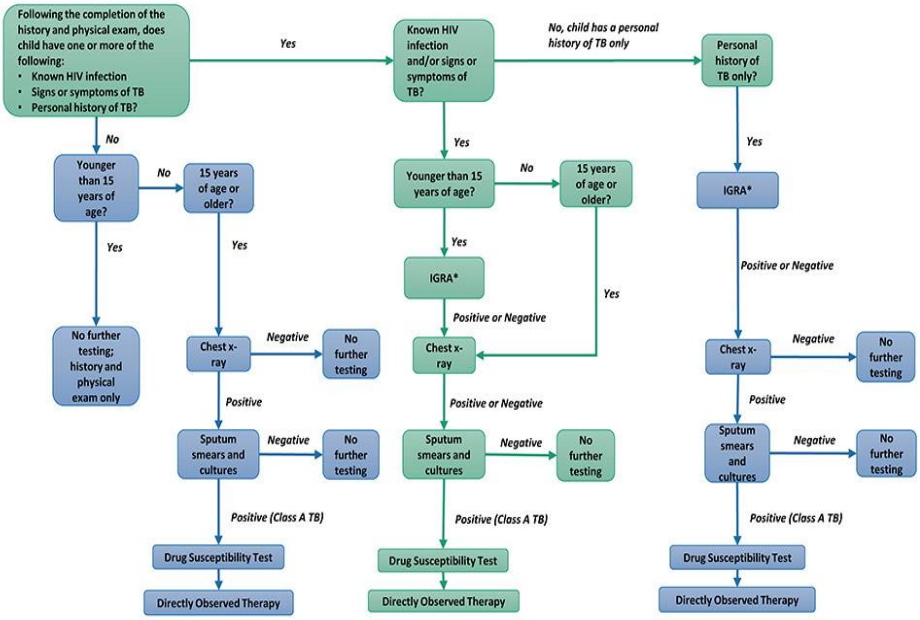
known to be important in pathogenesis[15]. For example, one such virulence factor is cord factor (trehalose dimycolate), which serves to increase survival within its host. Resistant strains of *M. tuberculosis* have developed resistance to more than one TB drug, due to mutations in their genes. In addition, pre-existing first-line TB drugs such as rifampicin and streptomycin have decreased efficiency in clearing intracellular *M. tuberculosis* due to their inability to effectively penetrate the macrophage niche[16].



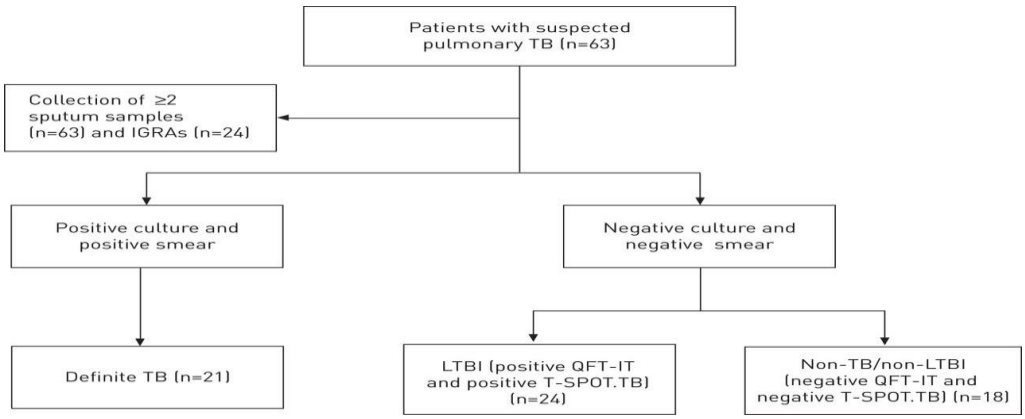
II. Methodology

Tuberculosis (TB) stays a main worldwide health hassle. It ranks as the second leading cause of dying from an infectious disorder worldwide. The trendy estimates included that there have been 8.6 million new TB cases in 2013 and 1.five million TB deaths [1] . Globally in 2012, 3.6% of latest TB instances and 20.2% of formerly handled cases were predicted to have MDR-TB; moreover, there have been about one hundred seventy,000 deaths from MDR-TB; however, appreciably drug-resistant TB (XDR-TB) has been mentioned by using one hundred and five international locations in 2014 [2] . On common, an estimated 9.7% of people with MDR-TB have XDR-TB in Bangladesh ranks 6th among 22 maximum burden tuberculosis countries in the world; however, total 173,619 instances had been notified in 2012, and total retreatment instances have been 8001 and 1.5% of the new and 29% of the retreatment TB cases had been MDR-TB [3]. consequently, speedy detection is now an urgent need. On this regard, rapid tools for TB detection advanced over the last decade in the industrialized global are in large part Nucleic Acid Amplification assessments (NAAT) primarily based on amplification of nucleic acids (DNA or RNA). Currently, line-probe assays (LPAs) and Xpert MTB/RIF had been formally advocated by way of the WHO and at the moment are in ordinary use in many TB laboratories in high and center-profits international locations [4]. The Xpert MTB/RIF assay has been described as a potential "recreation changer" for TB controls [5] . INNO-LiPA become the primary line probe assay that may detect simplest RIF resistant and has high sensitivity and specificity while subculture isolates are used. This assay was less touchy for

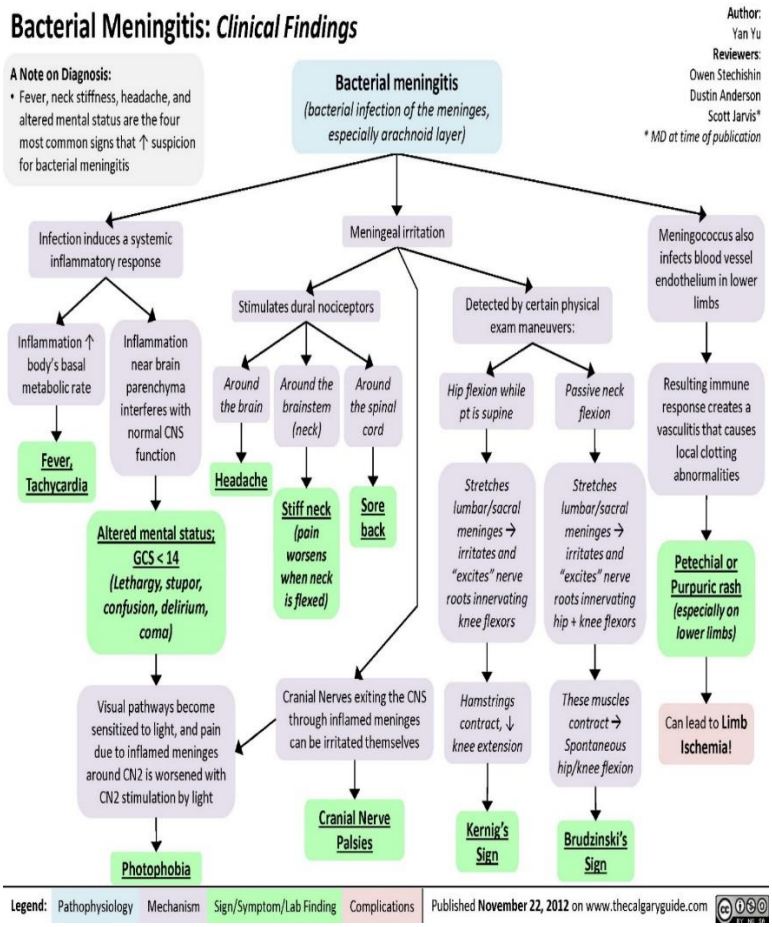
the detection of M. tuberculosis complex and much less accurate while the take a look at is implemented to medical specimens. The Xpert MTB/RIF assay is straightforward and robust sufficient to be completed with the aid of personnel with minimum training [6] - [10] . overall arms-on time is less than five mins and effects are to be had within 1 hour 55 minutes. Instrumentation prices for the GeneXpert machine are much like the ones of automatic liquid subculture machine for tuberculosis, and in keeping with-assay going for walks fees are also within the equal variety as way of life, in spite of massively superior performance in phrases of velocity, bio-protection, and ease of use [11] [12]. The purpose of this look at changed into to evaluate the overall performance of GeneXpert device for the detection of Mycobacterium tuberculosis with its Rifampicin resistance within shortest feasible time.



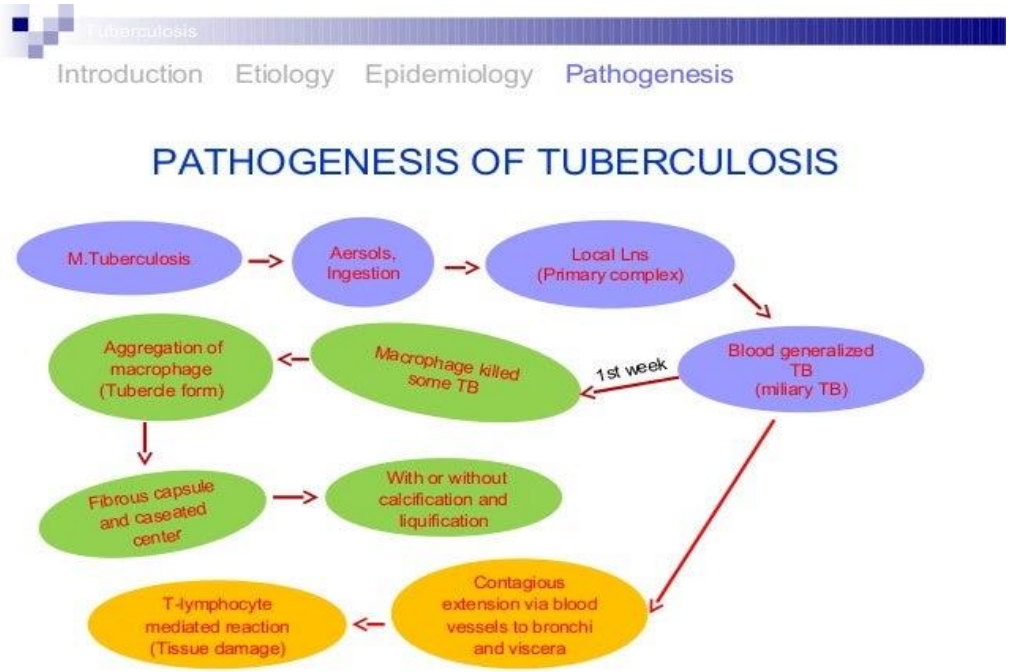
This go sectional observe turned into done in the branch of Microbiology of Sir Salimullah medical university, Dhaka and country wide Tuberculosis Reference Laboratory (NTRL), Dhaka for the duration of the length of January 2014 to December 2014. Suspected instances of MDR-TB sufferers who have been attended within the OPD and IPD of NIDCH and SSMC were decided on as study population. patients were excluded who had been present process treatment or having more-pulmonary tuberculosis or were new pulmonary tuberculosis instances. fresh sputum had been accumulated from suspected multidrug resistant pulmonary tuberculosis (MDR-TB) sufferers with all aseptic precaution and sputum samples were digested and decontaminated by means of N-acetyl-L-Cysteine-Sodium Hydroxide (NALC-NaOH) technique [8] . The sediment of processed sputum changed into used for microscopic examination by way of Ziehl-Neelsen (Z-N) staining and by auramine staining, lifestyle and drug susceptibility test (DST) on MGIT 960 media [8] . Liquid subculture and Drug Susceptibility check (DST) have been carried out in BACTEC MGIT 960 Media [13] . MGIT increase complement/ PANTA changed into aseptically added to the as it should be labeled MGIT tube and then properly blended focused specimen become added to each MGIT tube. Inoculated tubes had been placed on a rack and had been carried to BACTEC MIGT 960 machine for loading on the identical day [14] . The device changed into monitored for the entered susceptibility test set. The susceptibility Set service became scanned and the file changed into published. The tool printout indicated susceptibility results for every drug. GeneXpert MTB/RIF Assay (GXMTB/RIF-10) changed into finished. The primers within the Xpert MTB/RIF Assay make bigger a portion of the rpoB gene containing the 81 base pair "middle" vicinity. The probes are capable to distinguish between the conserved wild-type sequence and mutations inside the core vicinity which might be related to Rifampicin resistance. each Xpert MTB/RIF cartridge was labeled with the sample identification. The sample turned into then transferred into the sample chamber of the labeled Xpert MTB/RIF cartridge and lid become closed firmly. The barcode on the Xpert MTB/RIF cartridge become scanned.



The tool module door opened with the blinking inexperienced mild and the cartridge become loaded. The outcomes were interpreted by using the GeneXpert DX gadget from measured fluorescent signals and embedded calculation algorithms and displayed in the "View effects" window. decrease Ct values constitute a higher beginning attention of DNA template; higher Ct values constitute a lower awareness of DNA template. before amassing specimens, each patient become interviewed and informed written consent turned into taken from sufferers or prison mother or father of patients and applicable facts had been recorded systematically in a pre-designed statistics sheet[6]. Evaluation of consequences of liquid culture and GeneXpert MTB assay (n = one hundred).



Variables	Values
Sensitivity	ninety eight.52%
Specificity	a hundred%
NPV	96.96%
PPV	a hundred%
Accuracy	ninety nine%

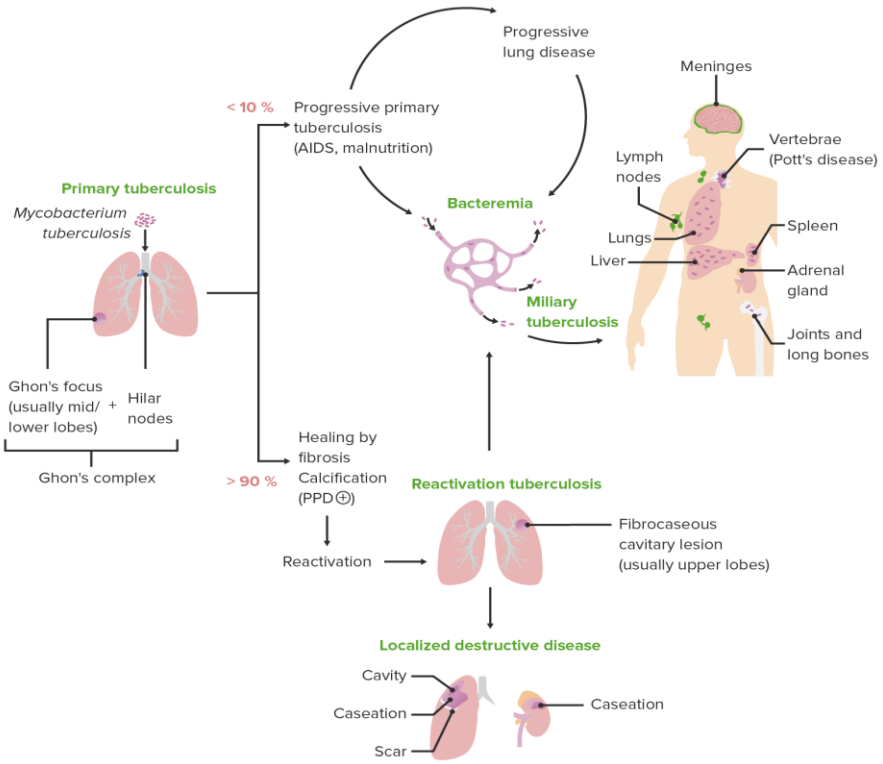


desk 2. overall performance of GeneXpert MTB/RIF Assay for detection of M. tuberculosis (n = a hundred). observe: NPV: terrible Predictive price; PPV: advantageous Predictive fee.

technique	RIF sensitive	RIF resistant
GeneXpert MTB/RIF	53	14 (20.nine%)
Drug Susceptibility take a look at	fifty three	15 (22.1%)

desk 3. Detection of rifampicin resistant M. tuberculosis by GeneXpert MTB/RIF assay and Drug Susceptibility check (DST) on liquid media (MGIT 960) lifestyle.

MTB/RIF and liquid way of life on MGIT 960 media. GeneXpert MTB/RIF detected 14 (20.nine%) instances of Mycobacterium tuberculosis which were rifampicin resistant among sixty seven M. tuberculosis high-quality samples. however liquid (MGIT 960) tradition detected 15 (22.06%) out of sixty eight M. tuberculosis nice samples.



III. Results:

At some stage in the study duration, 108 patients identified as tuberculosis were enrolled in this observe. Age variety of have a look at populace became three months to 18 years. Age distribution of instances, eleven (10.18%) had been within three months to at least one year, 22 (20.37%) had been in between 1 - 5 years, 28 (25.ninety two%) were among 6 - 10 years, 47 (43.fifty one %) cases had been between extra than 10 to 18 years age organization. maximum wide variety of instances, near about fifty percent found in 11 - 18 years age group (table 1). Gender distribution of the affected person confirmed 58 (fifty three.70%) were male and 50 (46.29%) have been woman (discern 1). determine 2 showed month sensible distribution of number of presumptive TB examined and diagnosed TB cases from august 2021 to July 2022. total 834 sufferers were suggested for checks, amongst them 108 instances had been diagnosed as TB instances[7]. most of the cases, 91 (eighty four.25%) have been recognized during the last 7 months of observe period that means from January to July 2022. because of pandemic situation of COVID-19 infection less range of patients visited all through months of yr 2021 at outpatient department[8]. Desk 2 suggests age smart distribution of pulmonary and extrapulmonary cases. amongst 108 TB instances forty four (40.74%) have been pulmonary TB and sixty four (59.25%) had been extrapulmonary TB. With older age group (eleven to 18 years) most of the cases 32 (68.08%) were extrapulmonary TB. Extrapulmonary TB blanketed TB lymphadenitis, tubercular pleural effusion, abdominal TB, disseminated TB, miliary TB, CNS TB. among 64 extrapulmonary TB cases 38 (fifty nine.37%) cases had been identified as TB lymphadenitis. Tubercular pleural effusion, stomach TB and disseminated TB changed into diagnosed in nine (14.06%), eight (12.five%) and six (9.375%) instances respectively (desk three) [9].

Age in year	number of cases	percent
3 months to < 1 12 months	11	10.18
1 - five yr	22	20.37
6 - 10 year	28	25.92
eleven - 18 years	47	43.51

Which are distribution of TB cases in keeping with age (n = 108).

Age in yr	Pulmonary TB (n = 44)	Extrapulmonary TB (n = 64)
three months to < 1 year	4	6
1 - five yr	eleven	12
6 - 10 yr 14	14	
eleven - 18 year	15	32

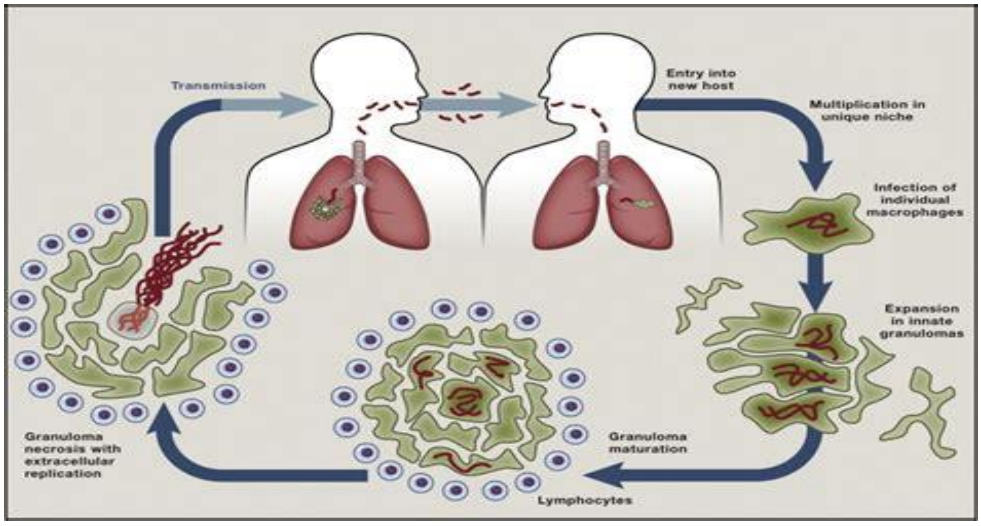
evaluation of sorts of TB in special age institution (n = 108).

Sputum samples were gathered from 100 clinically suspected multidrug resistant pulmonary tuberculosis (MDR-TB) sufferers. Liquid tradition had yielded the very best growth of Mycobacterium tuberculosis which was 68 (68%) instances. GeneXpert MTB assay showed 67% advantageous and 33% poor (table 1) [8]. All samples high quality by using GeneXpert were additionally wonderful by liquid subculture and additionally one case became fantastic by way of liquid tradition (desk 1). table 2 shows the overall performance of GeneXpert MTB/RIF assay when as compared to liquid subculture on MGIT 960 media for detection of M. tuberculosis. table 3 compares the rifampicin resistance detection[9]. This study had slight male preponderance (53.7%). Ahsan *et al*. found preponderance of males 27 (52.94%) in their study population as compared to females 24 (47.06%). The male to female ratio was 1.12:1, which was also found in several other studies [18] . This distribution was similar to study done in Bhutan which had 57% males and 43% females [19] . Bajaj *et al*. found a slight female preponderance (52.64%) in their study which is in similar to studies by Franco *et al*. in Brazil (51.6%) [9] and Suryanarayana *et al*. [20] . Their findings are not consistent with ours, probably male child get more preference in our social context like Bangladesh.

IV. Discussion:

The pathogenesis of TOM has been the challenge of discussion. three mechanisms are proposed; unfold to the middle ear from the Eustacian tube, from any other focus, and direct implantation via the external auditory canal and tympanic membrane perforation [2] [4] . it is quite possibly that our patient advanced TOM due to a disseminated pulmonary contamination, primarily based on chest imaging and putum lifestyle results.
clinical control of TOM is similar to for pulmonary tuberculosis [4] . Final results is typically terrific if remedy is initiated early inside the disorder path; however, delays in analysis result in headaches including facial paralysis and principal frightened system involvement [4] . surgical treatment can be indicated in sufferers with complex TOM, such as the ones patients with abscesses, fistula, facial palsy, or intracranial extension of infection [4] . In a study examining sixteen ears of 14 sufferers with TOM dealt with either medically or medically and surgically, dry ears have been received with chemotherapy by myself in all sufferers but one; however, normalized tympanic membranes were found in 50% of the chemotherapy organization and seventy five% of the surgical procedure group. length of otorrhea within

the organizations turned into now not statistically distinctive. The look at did discover that the frequency of hearing development become better inside the surgical group [4] . because of disseminated ailment in this affected person, she was controlled with 4-drug, at once observed remedy (DOTS) and recovered. however, residual hearing loss has endured.



This situation demonstrates how the diagnosis of TB, which includes uncommon bureaucracy which includes TOM could have far achieving outcomes for both pregnant girls and their infants.

TB sickness is difficult to diagnose in younger youngsters, and younger kids, once inflamed, are at high risk for development of disseminated TB including TB meningitis. pointers exist for control of infants born to girls with pulmonary disorder and include 6 months of isoniazid prophylactic remedy [7].

However, such guidelines are missing for toddlers born to moms with more-pulmonary disease [5]. Maternal TB locations neonates vulnerable to preterm delivery and/or boom postpone [5]-[7]. research from India file that even if infants born to mothers with tuberculosis continue to be uninfected, they may be more likely to be of low birth weight than wholesome controls (34.2% vs 6.3%) and have an multiplied threat of being born upfront (22.8% vs eleven.1%, RR 2.1, P < zero.01) [1] . In a observe from Mexico, the authors observed that pregnant girls withtuberculosis experienced a nine-fold extended risk of
preterm labor when compared to women with out tuberculosis [1] .

Inside the contemporary case, the infant turned into born at 32 weeks gestation, in all likelihood due to severe maternal tuberculosis ailment. This toddler obtained a full route of prophylactic remedy, supervised by means of the health branch, and was then lost to comply with up.

Tuberculosis (TB) is a main public fitness problem due to the fact it's miles very commonplace in evolved nations and growing international locations like Mali. Tuberculous lymphadenopathy is the maximum commonplace form of extrapulmonary tuberculosis and affects the cervical lymph nodes, axillary or inguinal. primary tuberculous axillary lymphadenopathy (after exclusion of medical disease in different frame) is extraordinarily rare in adults. Tuberculous lymphadenitis isolated axillary may be defined both through retrograde unfold of mediastinal lymph nodes, or by means of hematogenous unfold of a subclinical home, no longer detected via ordinary assessments. another reason for the co-incidence of tuberculosis and metastasis could be activating the silent contamination with Mycobacterium tuberculosis because of an immunocompromised situation in cancer sufferers [1] [8]. In our sufferers we think about a formerly undetected tuberculosis depend, clinical and paraclinical, because of their robust immunity. The development of cancer is an immunodeficient aspect. The coexistence of breast cancer and tuberculosis is very uncommon and much less suggested inside the literature. This coexistence increases problems in diagnostic and therapeutic management [2] [9]. the discovery was fortuitous due to pathological and immunohistochemical examinations. the first case become defined in 1899 via Wharti, accompanied later by others

V. Conclusion:

This case of TOM on this 22-year-antique girl illustrates the problems in making an accurate and well timed analysis of TB, in particular in instances of being pregnant, which may additionally result in long standing complications. TOM ought to be considered that in instances of chronic otitis media in patients from a TB endemic

area, and pregnant patients ought to be accompanied, as must their toddlers, to make sure proper remedy. on this study, EPTB instances had been greater than PTB in children. The most common more-pulmonary web page turned into lymph nodes. Fever was the most common presentation, accompanied via weight loss and cough. children 11 to 18 years have been maximum generally affected. diagnosis of tuberculosis changed into based on clinical suspicion supported by way of diverse investigations, particularly bacteriological detection with stool Xpert ultra in kids. From this look at, it can be concluded that GeneXpert MTB/RIF is a rapid and exceedingly dependable approach for identity of M. tuberculosis and rifampicin resistance from scientific sputum sample. The results are acquired within 2 hours with GeneXpert MTB/RIF assay. GeneXpert MTB/RIF assay need to be used routinely for detection of M. tuberculosis and Rifampicin resistant M. tuberculosis from sputum pattern of clinically suspected MDR patients where centers are available. The infection was effectively resolved following a particular remedy. this situation of cutaneous tuberculosis shows that it's miles an extraordinary event and need to be suspected in all patients with pores and skin lesions who do no longer reply to antibiotic remedy.

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