ORIGINAL RESEARCH PAPER

Volume-7 | Issue-7 | July-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

BREAST TUBERCULOSIS IN AIDS ERA

General Surgery

Dr Puneet K Agarwal * Associate Professor, Dept of Surgery, AIIMS Bhopal *Corresponding Author

Dr Saurabh Agarwal Assoscaite Professor ,Dept of Orthopaedics, Maharani Laxmibai Medical College Jhansi

ABSTRACT

Breast tuberculosis was considered rare in the developed world, but with the global spread of AIDS, this rare form of tuberculosis can be seen in settings of HIV infection. HIV exerts effect on the breast pathology and also influences the natural history of tuberculosis. Breast tuberculosis may lead to subclinical mastitis; mastitis or abscesses therefore HIV infected mothers with breast TB, are more likely to transmit HIV to their infants. Also HIV infection is considered a contraindication to the use of breast implants, largely because of the increased susceptibility to infection.

KEYWORDS

Introduction

Beginning in the 1920s, annual rates of tuberculosis in the United States declined. In 1953, when official annual reporting began, there were 84,304 reported cases of tuberculosis; by 1984, reported cases had dropped to 22,255, a decrease of about 5% per year (1). However, after 1984 the trend reversed, and by 1988 the annual rate of tuberculosis in the United States began to rise. In 1990, nearly 26,000 cases, or about 10/100,000 persons, were reported. More alarmingly, in certain populations, case rates exceeded 300/100,000. This paralleling with the emergence of AIDS epidemics in the world; placed a large group of patients at risk of tuberculosis (2).

Breast tuberculosis though considered rare in the developed world, but with the global spread of AIDS, this rare form of tuberculosis can be seen in settings of HIV infection. (3,4,5)

Tuberculosis breast as a presenting manifestation of AIDS

Tuberculosis of breast may present as a painless lump (nodular, diffuse, or sclerosing type), edema of breast, or a tender localized cold abscess that may ulcerate to form draining sinuses. Nipple discharge can also be a presenting feature in all forms of mammary TB.

Influence of Human Immunodeficiency Virus (HIV) on Breast Pathology

Breast pathology specific for patients infected with human immunodeficiency virus (HIV) has not been discussed much in the literature. Human immunodeficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS) that results from it may involve, directly or indirectly, virtually every organ system, including the breasts. As a consequence of their underlying immunodeficiency, patients infected with HIV are at risk, for the development of opportunistic infections.

Worldwide Tuberculosis is the most common opportunistic infection and the leading cause of death related to HIV infection. Even though the breast appears to be extremely resistant to infection by mycobacteria it is not uncommon to find mammary TB in the setting of HIV infection (6)

HIV may directly and indirectly affect the glandular, mesenchymal, and intramammary lymphoid tissue in seropositive patients. Compromised immunity, because of HIV infection leads to increased vulnerability for beginning of non-puerperal periductal mastitis (duct ectasia). Histologically dilated ducts are further disfigured by periductal fibrosis and are encircled by chronic inflammatory infiltrate. Sometimes these ducts may also be obliterated by granulomatous tissue (6). This may be the first manifestation of HIV infection leading to development of non puerperal mastitis and, one of the most common opportunistic infection in this scenario may be tuberculosis. (7,8)

Histologically, destructive caseating granulomas are strongly supportive of the diagnosis. Acid-fast bacteria detected in tissue sections or needle aspirates and mycobacterial culture are diagnostic. (6, 9)

A study was conducted at the National Health Laboratory Service (NHLS) in Johannesburg, South Africa, on confirmed HIV-positive patients who underwent breast FNA. In this study 18% patients presented with breast abscesses, out of which, for 30% of cases, microbiological studies confirmed M. tuberculosis infection (10).

Interaction of HIV and Tubercle Bacilli

HIV exerts a remarkable effect on the natural history of tuberculosis (11).

HIV infected individuals with latent infection of tuberculosis develop active tuberculosis at a higher rate 7 to 10%, Among individuals latently infected with tuberculosis who then become HIV infected, active tuberculosis develops at a rate of 7 to 10% per year rather than 8% per lifetime (12,13,14,15). Also the persons with HIV (regardless of CD 41 cell counts) who are newly infected with M. tuberculosis progress to active tuberculosis at a rate as high as 37% in the first 6 months rather than 2 to 5% in the first 2 years.(16,17). HIV confers anergy upon a large number of persons with HIV infection, thus confounding Tuberculin Skin Test (TST) interpretation. (18,19,20,21) HIV-infected persons may malabsorb drugs, perhaps because of HIV-related enteropathy, which may further complicate the treatment of tuberculosis. (22,23)

Correspondingly Tuberculosis also may influence the natural history of HIV infection by activating macrophages that harbor HIV. The result of activation is expression of HIV, rather than prolonged latency without expression of HIV (24,25). In one study, it was inferred that progression to AIDS occurred sooner among TST-positive persons not treated with INH than those treated with INH, even when tuberculosis was excluded as AIDS indicator disease. This suggests that treatment of latent tuberculosis can help preserve the immune function of HIV-infected individuals. (26).

Coexistence of Maternal Tuberculosis and HIV: Risk factor for transmission of HIV from mother to child

Breast tuberculosis may lead to subclinical mastitis; mastitis or abscesses so HIV infected mothers with breast TB, are more likely to transmit HIV to their infants. Mastitis can lead to higher viral RNA load in breast milk and therefore lead to mother to child transmission. This higher mother to child transmission is also attributed to inflammatory mediators, plasma derived components, and inflammatory cells present in breast milk that contain HIV. Ingestion of inflammatory cells by newborn may also be responsible for postnatal transmission of HIV (27,28,29,30).

A study was conducted in Kwa Zulu Natal, South Africa where HIV-infected and HIV-uninfected pregnant mothers, were enrolled in a nonrandomized intervention cohort to examine breast-feeding and HIV transmission and to study the possibility of promoting exclusive breast-feeding in a population with a high prevalence of HIV-1 infection. Mothers registered prenatally were counseled for breast-feeding until 6 months after delivery. Breast problems were documented per breast for 180 days after delivery, with 14-day recall

histories. It was seen that HIV-infected women who faced any breast health problem (i.e., bleeding nipple, pus oozing from a nipple or breast, or mastitis/abscess) were 3.55 times more prone to transmit HIV post natally to their infant. It was then concluded that HIV-infected mothers with bleeding of nipple, pus oozing from nipple or breast, or mastitis/abscess were more likely to transmit HIV to their infants.(31)

Gupta et al from John Hopkins University and National AIDS Research Institute Pune India conducted a study on 783 HIV-infected Indian mother-infant pair participants in randomized and ancillary HIV-infected cohorts of the Six Week Extended-Dose nevirapine (SWEN) Study, a study that compared extended nevirapine versus single-dose nevirapine, to reduce (mother-to-child transmission) MTCT of HIV among breast-fed infants. Exercising multivariable logistic regression, assessment of the impact of maternal TB on risk of MTCT of HIV was done and it was accomplished that TB in mothers is coupled with increased Mother to child transmission of HIV. Prevention of tuberculosis among HIV-infected mothers should be of immense importance for populations with major HIV/TB burden (32).

Another study was conducted to investigate determinants of breast milk RNA viral load among HIV-infected South African women, with particular attention to infant feeding mode and subclinical mastitis. Information on current infant feeding practice and a spot milk sample from each breast was obtained from 145 HIV-infected lactating women at 1, 6 and 14 weeks postpartum. The sodium/potassium (Na^+/K^+) ratio in milk was taken as an indicator of subclinical mastitis. The association between milk RNA viral load and maternal and infant characteristics was investigated using uni- and multivariate models. It was concluded that high levels were associated with subclinical mastitis and severe maternal immunosuppression(33)

Periprosthetic Breast Infection associated with TB & AIIDS

Infection following breast implants insertion is not common, with an incidence occasionally exceeding 3%.

Tubercular Breast prosthesis infections occur in individuals with pre-existing TB infection, and is a consequence to either haematogenous or contagiuous Tubercular bacilli spread (34). Insertion of prosthesis can produce a nidus for development of tuberculosis. To the best of our knowledge there are few reports in literature depicting tuberculosis breast implant infection. G Miles et al in that describes a female having bilateral breast prosthesis each one of which got infected by mycobacterium tuberculosis as a result of pulmonary tuberculosis published one and as a treatment part both prosthesis were surgically removed. (35)

Another case report published by Dale AP et al. in BMJ Case Rep 2015, describes a case of percutaneous breast implant herniation due to periprosthetic tubercular infection following miliary TB. The breast implants were removed and histopathological examination of the excised tissue revealed granuloma formation consistent with periprosthetic TB (34)

HIV infection is considered a contraindication to the use of breast implants, largely because of the increased susceptibility to infection (36)

Insertion of such large foreign bodies as breast implants require utmost precautions like sterility, together with avoidance of hematoma and tissue ischemia (35). A breast implant infected with M. tuberculosis should possibly be removed. Standard chemotherapy for at least six months is administered to eliminate the infection, and longer courses may be necessary for environmental mycobacteria.

When pus from a breast abscess is reported as sterile, or where a breast implant or abscess continues to discharge, the laboratory should be asked to stain and culture the fluid for acid-fast bacilli.(35)

Conclusion

Breast tuberculosis an unusual presentation of extra pulmonary tuberculosis-as an AIDS-defining condition, stresses the necessity for performing mycobacterial smears and cultures in patients who at risk for HIV infection. Also as breast tuberculosis may lead to subclinical mastitis; mastitis or abscesses so prevention of tuberculosis among HIV-infected mothers should be of immense importance for populations with major HIV/TB burden

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