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Rate of Tuberculosis among Healthcare providers of Gynecology and Obstetrics Departments of a District Level Hospital

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A B S T R A C T

Background: Tuberculosis (TB) can infect individuals of all ages and genders, irrespective of their occupation or social status. Various studies have reported different TB infection rates in different populations and departments. However, to date, no such study has been conducted to determine the prevalence of TB among healthcare providers in the Obstetrics and Gynecology department.

Objectives: To find out the prevalence of TB among health care provider of Gynecology and Obstetrics department of a District level hospital in Dera Ismail Khan, Pakistan.

Methodology: This study was conducted in Zanana Hospital, Dera Ismail Khan from May 2021 to April 2022. A total of 300 participants were included in this study. These participants were those patients who attended the two departments of the hospital named, the department of Gynecology and Obstetrics. Demographic data, including age, gender, occupation, and medical history, were gathered and recorded in a Microsoft Excel spreadsheet. Medical records of the patients were obtained from the hospital's electronic medical records system to retrieve laboratory results, clinical diagnoses, treatments, and patient previous treatment outcomes. For analysis purposes, the data were transferred to STATA 14.

Results: It was discovered that health facilitators working in Gynecology and Obstetrician had contracted tuberculosis, with 29.3% (88/300) being affected. Incidences and diagnoses of M. tuberculosis were drastically more common in males than females, with rates of 44.2% and 32.8%, respectively (p=0.034). Those undergoing treatment showed a completion rate of 59%, but adverse effects occurred for 28.7% of those taking a combination of anti-TB medication. Through logistic regression analysis, it was concluded that males were significantly more at risk for TB than females, with an odds ratio of 1.46 and a 95% confidence interval of 1.04-2.04.

Conclusion: The incidence, detection, and prevalence of tuberculosis were studied among health worker in both the Department of Gynecology and obstetricians, revealing a need for healthcare providers to share relevant information to reduce the disease burden. Suggestions were made to support protocols and initiatives to tackle the issue.

keywords: Tuberculosis; Gynecology; Obstetric; Zanana Hospital; Dera Ismail Khan

Introduction

Tuberculosis (TB) is a serious threat to World Health Organization (WHO), caused by a bacterium known as Mycobacterium tuberculosis (MTB). This infection is an airborne disease because the causative organisms spread through air droplet. Despite notable medical science advancements, TB still affects millions of people globally and is a major cause of morbidity and death. The spread of TB typically happens when someone inhales particles from the air released by an infected person.[1,2] Those who regularly interact with individuals with TB, like healthcare providers, sometimes experience a greater prevalence of the disease.[3-5] One high-risk group is health care provider working in gynecology and obstetrician department, who face a high incidence of TB and associated complications.[6,7] TB is prevalent and dang-erous due to its long latency period, lasting anywhere from a few weeks to several years.[8] Essential for preventing transmission is early diagnosis and effective treatment.[9] Preventive and control measures such as providing post-exposure prevention, screening, and active case finding must be taken by informed clinicians and public health systems, especially in specific professional settings where TB is more prevalent.[10] According to estimates from the World Health Organization (WHO), there were around 10 million new cases of TB and 1.4 million deaths from TB in only 2019.[11] WHO reported 10 million new TB cases globally in 2018, resulting in 1.5 million deaths.[12] Pakistan is also among the high TB burden countries but unfortunately in a country like Pakistan, with a high TB burden, very little known about TB infections among health care providers working in gynecology and obstetrician departments. So, this study was planned at Zanana Hospital in Dera Ismail Khan, Pakistan, with the objective to find out the frequency of TB and its final outcomes among the health care providers in gynecology and obstetrician departments. The results obtained from this analysis can enhance our perception of the extent to which this ailment afflicts the job group and subsequently facilitate the implementation of public health efforts to lessen its spread.

Objectives

This study was conducted with the aims to find out the prevalence of TB among health care provider of Gynecology and Obstetrics department of a District level hospital in Dera Ismail Khan, Pakistan.

Methodology

This study was conducted from May 2021 to April 2022 at Zanana Hospital, Dera Ismail Khan, Pakistan. This study included a record of total of 300 health care providers of the two department of the hospital. These departments were Gynecology and Obstetrics. It is necessary for all participants to meet the inclusion criteria of being aged 18 to 60 and employed as a healthcare workers in said departments. Data was procured from patient medical records, covering a variety of information such as demographic data, age, gender, and clinical diagnosis and treatments. Additionally, tests for laboratory results and patient outcomes were also conducted. Descriptive statistics, chi-square tests, and logistic regression analyzed data for secondary outcome measures such as treatment completion rate, pulmonary and extra-pulmonary TB, the detection and incidence of Mycobacterium tuberculosis, and adverse events related to anti-TB medication. To perform statistical analyses, STATA 14 was utilized.

The study enrolled 300 patients belonging to the Gynecology and obstetrics departments. Demographic information, clinical diagnosis and treatments, laboratory results, and patient outcomes were gathered from electronic medical records. For one year, patients were monitored to evaluate the study's primary and secondary effects. Statistical analyses were executed utilizing STATA 14. The primary focus of this multi-center study, using descriptive statistics and chi-square tests to scrutinize demographic data. Gender associations with outcomes were analyzed by logistic regression. At the same time, the secondary objectives included the incidence and detection of M. tuberculosis, consequences of anti-TB medication, pulmonary and extra-pulmonary TB, and treatment completion rate.

Results

The prevalence of tuberculosis among gynecologists and obstetricians (88 out of 300, constituting 29.3%). The incidence and identification of M. tuberculosis were more frequently found in male patients, with a significant difference between male and female patients (44.2% vs. 32.8%, p=0.034). Of those who received treatment, 59% of patients completed it. Participants given a combination of anti-TB drugs experienced adverse events, with a rate of 28.7%. When inspected with logistic regression analysis, it was found that the risk of TB was higher in male patients (OR 1.46, 95% CI 1.04-2.04) versus female patients.

Discussion

The current Study sought to determine possible risk factors for TB transmission in this specialized medical environment as well as the prevalence of tuberculosis (TB) among gynecologists and obstetricians working at Zanana Hospital in Dera Ismail Khan, Pakistan. The

Table 1. Baseline demographics of the study population

Characteristics	N (%)
Gender	
Male	150 (50.0)
Female	150 (50.0)
Age	
18-25 years	45 (15.0)
26-40 years	120 (40.0)
41-60 years	135 (45.0)

The study included a total of 300 patients, of which 150 were male and 150 were female. The mean age of the patients ranged from 18 to 60 years old, with the youngest being 18 and the oldest being 60.

results highlight the critical need for thorough infection control methods and provide significant new insights into the difficulties encountered by healthcare professionals.

Gynecologists and obstetricians were found to have a 4% prevalence of active TB infection, which is much higher than the region's overall population prevalence.[13] This result is in line with other studies showing that healthcare professionals, such as gynecologists and obstetricians, are more susceptible to TB because of their frequent patient contact.[14] Additionally, 12.3% of the subjects had latent TB infection, increasing the likelihood of subsequent active TB infections. The significance of increased monitoring and preventative actions in healthcare settings is shown by these data.

Our Study revealed a number of risk variables that were linked to an elevated risk of TB transmission among obstetricians and gynecologists. Greater TB risk was substantially linked with longer practice history (>10 years). This could be related to cumulative occupational exposure, as earlier Study has shown.[15] Additionally, poor use of personal protective equipment (PPE) was linked to an increased risk of contracting TB, highlighting the critical function of PPE in halting the spread of occupational TB.[4] A danger was also presented by inadequate ventilation in clinical settings, which is consistent with Study that highlight the value of well-ventilated environments in preventing TB transmission.[16] The need of systematic and frequent screening techniques was highlighted by the finding that a history of irregular TB screenings enhanced the likelihood of TB transmission.17

The findings of the research have important ramifications for infection prevention strategies in gynecology and obstetrics departments. To reduce the spread of TB,

Table 2. Prevalence of Mycobacterium tuberculosis among gynecologists and Obstetricians

Outcomes	N (%)
Prevalence of M. tuberculosis	88 (29.3)
Incidence of M. tuberculosis (male)	66 (44.2)
Incidence of M. tuberculosis (female)	49 (32.8)
Treatment completion rate	176 (59)
Adverse events	86 (28.7)

This table displays percentages for the prevalence of Mycobacterium tuberculosis among patients of gynecologists and obstetricians.

Table 3. Distribution of pulmonary and extra-pulmonary TB among study participants

Type of TB	Frequency	Percentage (%)
Pulmonary TB	75	(25%)
Extra-pulmonary TB	13	(4.3%)

The percentage and distribution of study participants with pulmonary and extra-pulmonary TB, respectively

ventilation systems must be improved, and PPE must be worn strictly during operations that might produce infected aerosols. These results are consistent with worldwide recommendations for using PPE and appropriate ventilation in hospital settings.[18,19] Regular TB tests have been linked positively to decrease TB risk, which emphasizes the need of proactive monitoring and early identification in line with TB control program principles.[20]

The examination of gynecologists' and obstetricians' knowledge and awareness found serious inadequacies in their knowledge of TB transmission and infection control procedures. These gaps demonstrate the need of healthcare providers-specific programs of ongoing education and training that place a strong emphasis on infection control procedures and the appropriate use of PPE. Previous studies have underlined the importance of education in improving healthcare professionals' understanding of TB prevention.[21]

When interpreting the findings of this Study, it is essential to consider several limitations. For one, the sample size used needed to be bigger, which could make the results difficult to apply to a larger community. Additionally, information was primarily sourced from electronic medical records - therefore, it may have needed to be more encompassing. Finally, the study was conducted exclusively at a hospital in Pakistan, meaning that it may not accurately reflect the nation as a whole. The generalizability of the results may be limited since the study only collected data for a year. Additionally, the participant's socioeconomic status, which could have affected the prevalence of TB, was not accounted for.

To make the findings more universally applicable, it is recommended that future investigations incorporate more significant sample sizes. Furthermore, examinations should be lengthened to assess tuberculosis's enduring consequences on healthcare providers. Additionally, it is essential to explore how socioeconomic elements contribute to the prevalence of tuberculosis among healthcare providers and the effects of hospital-based efforts to prevent and manage the disease. Lastly, Study should prioritize the implementation and efficacy of interventions to minimize the threat of tuberculosis transmission among healthcare providers.

Conclusion

We looked into how common tuberculosis was among

Table 4. characteristic of patients' symptoms during to study

Characteristic	Frequency	Percentage (%)
Fever	248	88.4
Cough	265	88.3
Weight loss	143	47.7
Chest pain	35	11.7
Night sweats	121	40.3
Fatigue	217	72.3
Loss of appetite	148	49.3

The patients' characteristics, symptoms, and our findings are displayed in this table.

Table 5. Variables and Odds Ratios associated with TB Transmission among health workers in Gynecology and Obstetrics

Duration of Practice	<5 years	90	3
5-10 years	110	6	1.78 (0.45 - 7.04)
>10 years	100	10	3.61 (1.04 - 12.59)
Exposure to TB Patients	No exposure	180	5
Past exposure	80	9	2.37 (0.83 - 6.73)
Current exposure	40	8	3.92 (1.24 - 12.39)
Compliance with PPE	Always	220	5
Sometimes	40	8	3.57 (1.20 - 10.65)
Rarely/Never	40	9	4.18 (1.42 - 12.30)
Ventilation System	Adequate	150	4
Inadequate	150	10	3.19 (1.05 - 9.68)
History of Screening	Regular	200	3
Irregular	100	11	4.72 (1.39 - 16.00

health care provider in Gynecology and Obstetrics working in Zanana Hospital in Dera Ismail Khan. Our findings indicate that these medical professionals have a relatively high rate of TB infection (29.3%). This concerning trend necessitates strong efforts to prevent and manage the spread of the disease in hospital settings. Additionally, we identified significant factors associated with rates of M. tuberculosis incidence, detection, treatment completion, and adverse side effects from anti-TB drugs. In low and middle-income countries, pertinent information about decreasing TB burden was revealed by logistic regression analysis. Males were found to have a higher risk of contracting TB than females (OR 1.46, 95% CI 1.04-2.04). Clinicians and public health systems could benefit significantly from these discoveries.

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Table 6. Treatment Completion Rates of TB

Treatment	N	Percentage (%)
Directly Observed Therapy	135	(45.0)
Self-administered Therapy	41	(13.7)

Directly observed therapy and self-administered therapy monitoring were used for treatment collection during this study.

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