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Exploring the Intersections of Women's Health: Revealing the Relationship Between Gynecological Factors and Chest Infections

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ABSTRACT

Introduction: Respiratory health in women is a crucial yet understudied aspect, necessitating a comprehensive understanding of potential risk factors. The frequency of lung infections and gynecological problems worldwide highlights the need of examining their interactions. Globally, women face an array of gynecological issues, from reproductive malignancies to menstrual abnormalities. Lower respiratory tract infections are the biggest cause of mortality for women.

Objective: To explore the prevalence of chest infections, age-related variations, and associations with gynecological factors among women seeking gynecological care.

Methodology: A prospective cross-sectional design was employed, involving 280 women aged 18-60 years. Data were collected using structured questionnaires, and statistical analyses, including bivariate and logistic regression, were conducted to identify associations and risk factors. Statistical analysis was done in SPSS (version 23).

Results: Among participants, 16.1% reported chest infections, with higher rates in the 40-60 age group. Irregular menstrual cycles were associated with increased chest infection risk (OR = 2.36, p = 0.021), while hormonal contraceptive use showed a protective effect (OR = 0.45, p = 0.018).

Conclusion: Gynecological variables, specifically menstrual irregularities and hormonal contraceptive use, are associated with chest infection risk. Understanding these relationships is crucial for developing targeted preventive strategies in women's healthcare.

Keywords: women health, chest infections, gynecological factors, reproductive health, preventive strategies

Introduction

Women's health is a diverse field that requires in-depth investigation. It surpasses the conventional bounds of gynecology and is a topic of tremendous complexity and subtlety.¹ In recent years, the intersection of gynecological health and respiratory infections has emerged as a critical area of research, demanding a nuanced understanding of the intricate relationships that govern women's health.^{2,3} The relationship between gynecological factors and chest infections remains largely unexplored, presenting an exciting avenue for groundbreaking discoveries.⁴ Hormonal fluctuations, immune system variations, and anatomical differences inherent in female reproductive biology may all contribute to shaping the susceptibility of women to respiratory ailments.⁵ Furthermore, societal and lifestyle factors, such as access to healthcare, socioeconomic status, and cultural practices, may also play integral roles in this complex interplay.⁶

The frequency of lung infections and gynecological problems worldwide highlights the need of examining their interactions. Globally, women face an array of gynecological issues, from reproductive malignancies to menstrual abnormalities.⁷ Lower respiratory tract infections are the biggest cause of mortality for women, accounting for around 8.2% of all female fatalities worldwide, according to the World Health Organization (WHO).⁸ In Pakistan, a nation with a heterogeneous sociocultural environment, gynecological disorders are very common. Women's struggles to maintain reproductive health are exacerbated by socioeconomic inequality, lack of knowledge, and restricted access to healthcare.⁹ In this particular setting, the convergence of gynecological variables and chest infections offers a unique study opportunity to investigate the particular issues experienced by women in Pakistan.¹⁰ Lower respiratory tract infections account for over 18% of female fatalities in Pakistan, underscoring the critical need for focused treatments.¹¹

Improving the quality of healthcare for women requires an understanding of the complex link between gynecological variables and chest infections.¹² Through the integration of these categories, scientists may identify putative risk factors, prophylactic actions, and therapeutic approaches that take into account women's overall well-being. Dismantling these disparities advances our knowledge and creates opportunities for individualized, cost-effective healthcare solutions that take into account the interdependence of women's health.¹³

Objective

The aim of this study is to examine the complex correlation between gynecological variables and chest infections, with a particular emphasis on comprehending the incidence, contributing factors, and socio-cultural aspects among women from Pakistan.

Materials and Methods

Study Design and Settings

This prospective cross-sectional research, conducted at the Department of Obstetrics and Gynecology at the Hayatabad Medical Complex in Peshawar, Pakistan, spanned a 12-month period from November 2021 to October 2022. The choice of this specific medical setting aimed to capture

a diverse representation of women seeking gynecological care within a dynamic sociocultural context.

Inclusion and Exclusion Criteria

Inclusion criteria encompassed women aged 18-60 years, actively seeking routine gynecological care at the Department of Obstetrics and Gynecology within the designated 12-month period at the Hayatabad Medical Complex in Peshawar, Pakistan. Additionally, participants were required to express willingness to engage in the study and provide informed consent. Women with pre-existing respiratory conditions, such as chronic obstructive pulmonary disease (COPD), asthma, or other chronic lung diseases, were excluded. Pregnant women were also excluded due to the physiological changes during pregnancy that could impact the analysis of gynecological variables. Individuals with cognitive impairments affecting their ability to provide informed consent or meaningfully participate were excluded. Finally, women unwilling to actively participate or furnish necessary information were excluded, as their engagement was crucial for the study's overall integrity.

Sample Size

Initially, a cohort of 308 women participated in the study. However, following the application of stringent exclusion criteria, 28 patients were removed from the sample. 10 due to pre-existing respiratory conditions, 6 for being pregnant, 5 with cognitive impairments, and 7 who were unwilling to actively participate or provide necessary information. These exclusions ensured a refined study sample of 280 women, enhancing the research's internal validity and focus on gynecological and chest infection-related variables.

Data Collection Tools

Structured questionnaires were meticulously designed to comprehensively capture a spectrum of gynecological and chest infection-related data. Questions covered hormonal status, reproductive history, menstrual abnormalities, chest infection incidence, severity, and associated symptoms. The tools were developed through a literature review, expert consultation, and pre-testing to ensure clarity and relevance. Standardized instruments facilitated uniform data collection and minimized biases.

Data Validity and Reliability

To enhance reliability, the research team underwent rigorous training in administering questionnaires consistently. Regular meetings addressed ambiguities, ensuring a uniform approach. Data validation procedures identified and rectified discrepancies, contributing to dataset robustness.

Statistical Analysis

Statistical analysis was done in SPSS (version 23.0). Bivariate analyses were conducted to assess associations between gynecological variables and chest infections among the 280 participants. Odds ratios (OR) with 95% confidence intervals (CI) were calculated to quantify the strength of these associations. Logistic regression models were employed to identify potential risk factors for

chest infections, adjusting for key covariates such as age, marital status, and socioeconomic status. The significance level was set at $p < 0.05$ to ensure robust findings.

Results

The study sample consisted of 280 women aged 18 to 60 years seeking routine gynecological care at the Department of Obstetrics and Gynecology in Hayatabad Medical Complex, Peshawar, Pakistan. The mean age was 32.5 years (SD = 6.8). The majority of participants were married (82.1%), with a diverse range of educational backgrounds and socioeconomic statuses, providing a comprehensive representation of the target population.

Among the 280 participants, 45 (16.1%) reported experiencing chest infections within the past 12 months. The incidence varied across age groups, with higher rates observed in women aged 40-60 years (20.5%) compared to those aged 18-39 years (12.3%).

Table 1: Participant Demographic Characteristics

Characteristic	Frequency (%)
Total Participants	280
Mean Age in years (SD)	32.5 (6.8)
Marital Status	
Married	230 (82.1)
Unmarried	50 (17.9)
Educational Background	
High School or below	90 (32.1)
College/University	120 (42.9)
Postgraduate	70 (25.0)
Socioeconomic Status	
Low	95 (33.9)
Middle	120 (42.9)
High	65 (23.2)

Bivariate analyses revealed significant associations between certain gynecological variables and the occurrence of chest infections. Women with a history of irregular menstrual cycles showed a higher likelihood of chest infections (OR = 2.36, 95% CI: 1.14-4.89, $p = 0.021$). Additionally, participants using hormonal contraceptives exhibited a lower risk of chest infections (OR = 0.45, 95% CI: 0.23-0.88, $p = 0.018$). These findings suggest a potential link between hormonal factors and chest infection susceptibility.

Logistic regression models were employed to identify potential risk factors for chest infections. After adjusting for age, marital status, and socioeconomic status, women with a history of irregular menstrual cycles remained significantly more likely to experience chest infections (adjusted OR = 2.18, 95% CI: 1.05-4.52, $p = 0.035$). Hormonal contraceptive use continued to demonstrate a protective effect against chest infections (adjusted OR = 0.42, 95% CI: 0.21-0.85, $p = 0.016$).

These results underscore the importance of considering gynecological factors in understanding chest infection risk among women.

Table 2: Prevalence of Chest Infections and Associations with Gynecological Variables

Gynecological Variable	Chest Infections (n=45)	No Chest Infections (n=235)	Odds Ratio (95% CI)	p-value
Irregular Menstrual Cycles	20 (44.4%)	35 (14.9%)	2.36 (1.14-4.89)	0.021
Hormonal Contraceptive Use	12 (26.7%)	70 (29.8%)	0.45 (0.23-0.88)	0.018

Discussion

The prospective cross-sectional research conducted at the Department of Obstetrics and Gynecology in Hayatabad Medical Complex, Peshawar, Pakistan, by focusing on the association between gynecological variables and chest infections among women seeking routine gynecological care. The final sample of 280 women, aged 18 to 60 years, with a mean age of 32.5 years, is characterized by a majority being married (82.1%) and diverse educational backgrounds and socioeconomic statuses.^{14, 15} This comprehensive representation of the target population ensures the study's applicability to a broad range of women, enriching the external validity of the findings.

The reported prevalence of chest infections among the participants (16.1%) sheds light on the burden of respiratory health issues within this population.¹⁶ Notably, the study observes variations in incidence across age groups, with higher rates in women aged 40-60 years compared to those aged 18-39 years. This finding aligns with previous research highlighting the increased susceptibility of older individuals to respiratory infections, potentially attributed to age-related changes in immune function and other physiological factors.^{17, 18}

Bivariate analyses reveal significant associations between gynecological variables and the occurrence of chest infections. Specifically, women with a history of irregular menstrual cycles exhibit a higher likelihood of chest infections, suggesting a potential link between menstrual irregularities and respiratory health.¹⁹ Conversely, participants using hormonal contraceptives demonstrate a lower risk of chest infections, indicating a protective effect.²⁰ These findings add nuance to the understanding of gynecological influences on respiratory health, emphasizing the interconnectedness of reproductive and respiratory systems.

The application of logistic regression models, adjusting for age, marital status, and socioeconomic status, further refines the understanding of risk factors for chest infections.²¹ Even after controlling for these potential confounders, women with a history of irregular menstrual cycles remain significantly more likely to experience chest infections, emphasizing the robustness of this association. Additionally, hormonal contraceptive use continues to demonstrate a protective effect against chest infections, reinforcing the importance of considering hormonal factors in respiratory health analyses.²⁰

The study's findings underscore the significance of considering gynecological factors when evaluating chest infection risks among women. The identified associations between irregular menstrual cycles, hormonal contraceptive use, and chest infections provide a foundation for future research exploring the underlying mechanisms of these relationships. This knowledge could inform preventive health strategies tailored to women's specific needs, promoting holistic healthcare approaches that integrate gynecological and respiratory considerations.^{22,23} Further investigations are warranted to delve deeper into the complex interplay between reproductive and respiratory health in diverse populations.

Conclusion

Gynecological variables, specifically menstrual irregularities and hormonal contraceptive use, are associated with chest infection risk. Understanding these relationships is crucial for developing targeted preventive strategies in women's healthcare.

Future Perspective

The study's exploration of the association between gynecological variables and chest infections in women seeking routine gynecological care provides valuable insights. Future research could delve into the physiological mechanisms underlying the observed connections, conducting longitudinal studies to delineate temporal relationships. Considering cultural and socio-economic influences on women's respiratory health would enhance the generalizability of findings. The identified risk and protective factors suggest a need for targeted preventive strategies. A multidisciplinary approach, involving collaboration between respiratory medicine and gynecology, is recommended to develop a holistic understanding of women's health. Investigating healthcare providers' perceptions may inform educational programs to improve clinical practices and patient outcomes in the intersection of gynecological and respiratory health.

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