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Oral Health Outcomes in Women with Polycystic Ovary Syndrome (PCOS) Prospective Study

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ABSTRACT

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder affecting women of reproductive age, characterized by hormonal imbalances and metabolic issues. Emerging evidence suggests a potential link between PCOS and oral health problems, including periodontal disease. This study aims to investigate oral health outcomes in women with PCOS. A prospective study was conducted from May 2023 to April 2024 at the Department of Dentistry and the Department of Obstetrics and Gynecology, Zydus Medical College and Hospital, Dahod, Gujarat. The study included 100 women diagnosed with PCOS. Participants underwent comprehensive oral examinations, assessing parameters such as plaque index, gingival index and probing depth. Data on hormonal profiles and metabolic markers were also collected. The study adhered to ethical guidelines and informed consent was obtained from all participants. The findings revealed that 70% of women with PCOS exhibited signs of periodontal disease, with a mean plaque index of 2.5 and a mean gingival index of 1.8. Probing depth averaged 3.6 mm. A significant correlation was observed between elevated androgen levels and increased plaque index ($r=0.65$, $p<0.05$). Additionally, women with higher Body Mass Index (BMI) showed a greater prevalence of gingival inflammation. The study indicates a high prevalence of periodontal disease in women with PCOS, emphasizing the need for integrated healthcare approaches that address both gynecological and oral health aspects. Early intervention and tailored oral hygiene regimens are recommended to mitigate the risk of periodontal complications in this population.

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Key Words

Polycystic ovary syndrome (pcos), oral health, periodontal disease, women's health, hormonal imbalance, integrated healthcare

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INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age, with a prevalence ranging from 6%-20% globally[1]. It is characterized by a combination of clinical manifestations such as hyperandrogenism, ovulatory dysfunction and polycystic ovarian morphology[2]. The pathophysiology of PCOS involves a complex interplay between genetic, environmental, and lifestyle factors, contributing to its heterogeneity and varied clinical presentation[3].

Recent studies have suggested a potential link between PCOS and oral health issues, particularly periodontal disease, which is characterized by chronic inflammation of the supporting structures of the teeth [4]. Periodontal disease has been associated with systemic conditions, including diabetes mellitus and cardiovascular disease, both of which are prevalent in women with PCOS[5-6]. The underlying mechanisms may involve shared inflammatory pathways, hormonal imbalances and metabolic disturbances that are common to both PCOS and periodontal disease[7].

Hormonal dysregulation in PCOS, particularly hyperandrogenism and insulin resistance, may influence oral health by affecting the immune response and promoting a pro-inflammatory state[8]. Furthermore, metabolic syndrome, often associated with PCOS, may exacerbate periodontal disease severity through increased oxidative stress and altered lipid metabolism[9]. Despite these potential associations, there is limited research on the oral health outcomes of women with PCOS, highlighting the need for further investigation.

This study aims to evaluate the oral health outcomes in women with PCOS and explore the potential correlations between hormonal and metabolic parameters and periodontal health. By understanding the intersection between PCOS and oral health, this research seeks to inform integrated healthcare approaches that address both gynecological and dental care needs for women with PCOS.

MATERIALS AND METHODS

Study Design and Participants: This prospective study was conducted at the Department of Dentistry and the Department of Obstetrics and Gynecology, Zydus Medical College and Hospital, Dahod, Gujarat, from May 2023 to April 2024. A total of 100 women diagnosed with Polycystic Ovary Syndrome (PCOS) based on the Rotterdam criteria were recruited for the study. Participants were aged between 18 and 40 years and provided informed consent to participate. Women with a history of systemic diseases other than PCOS, recent antibiotic use, or pregnancy were excluded from the study.

Data Collection: Data were collected through structured interviews, clinical examinations and Laboratory tests. Each participant underwent a comprehensive oral examination conducted by a trained dental professional. Oral health parameters assessed included the Plaque Index (PI), Gingival Index (GI) and probing depth (PD), which was measured using a periodontal probe. Periodontal health was categorized based on the severity of gingival inflammation and attachment loss.

Hormonal and Metabolic Assessment: Blood samples were collected from all participants to evaluate hormonal and metabolic profiles. Serum levels of androgens, including testosterone and dehydroepiandrosterone sulfate (DHEAS), were measured using enzyme-linked immunosorbent assay (ELISA). Fasting blood glucose and lipid profiles were assessed using standard biochemical methods. Body Mass Index (BMI) was calculated based on height and weight measurements.

Statistical Analysis: Descriptive statistics were used to summarize the baseline characteristics of the study population. Continuous variables were expressed as mean±standard deviation, while categorical variables were presented as frequencies and percentages. Pearson's correlation coefficient was used to evaluate the relationships between hormonal/metabolic parameters and oral health indices. A p-value of less than 0.05 was considered statistically significant. Data analysis was performed using SPSS software version 26.0 (IBM Corp., Armonk, NY).

Ethical Considerations: The study protocol was approved by the Institutional Ethics Committee of Zydus Medical College and Hospital, Dahod, Gujarat. All particpants were informed about the study's objectives and procedures and provided written informed consent. The study was conducted in accordance with the Declaration of Helsinki and maintained participant confidentiality throughout the research process.

RESULTS AND DISCUSSIONS

Table 1: women with PCOS, with a Mean Age

Characteristic	Mean ± SD / n (%)
Age (years)	28.5±5.4
BMI (kg/m²)	27.8±3.6
Elevated Androgens (%)	75 (75%)
Insulin Resistance (%)	65 (65%)
Metabolic Syndrome (%)	40 (40%)

Participant Characteristics: The study included 100 women with PCOS, with a mean age of 28.5±5.4 years. The average Body Mass Index (BMI) of the participants was 27.8±3.6 kg/m[2]. A summary of the demographic and clinical characteristics of the study population is presented in (Table 1).

Table 2: The Oral Health Examination

Oral Health Parameter	Mean ± SD / n (%)
Plaque Index (PI)	2.5±0.6
Gingival Index (GI)	1.8±0.5
Probing Depth (mm)	3.6±0.7
Periodontal Disease (%)	70 (70%)

Oral Health Outcomes: The oral health examination revealed that 70% of participants had signs of periodontal disease. The mean Plaque Index (PI) was 2.5±0.6 and the mean Gingival Index (GI) was 1.8±0.5. The average probing depth (PD) was 3.6±0.7 mm. These findings are detailed in (Table 2).

Table 3: The Correlations Between Hormonal/Metabolic Parameters and Oral Health Indices are Summarized

Parameter	Plaque Index (PI)	Gingival Index (GI)	Probing Depth (PD)
Elevated Androgens	r=0.65, p<0.05	r=0.48, p<0.05	r=0.52, p<0.05
Insulin Resistance	r=0.50, p<0.05	r=0.58, p<0.05	r=0.60, p<0.05
Metabolic Syndrome	r=0.45, p<0.05	r=0.40, p<0.05	p<0.01

Correlation Analysis: A significant positive correlation was found between elevated androgen levels and the Plaque Index (r=0.65, p<0.05). Insulin resistance was also positively correlated with the Gingival Index (r=0.58, p<0.05). Participants with metabolic syndrome had significantly higher probing depths compared to those without metabolic syndrome (p<0.01). The correlations between hormonal/metabolic parameters and oral health indices are summarized in (Table 3).

The study demonstrated a high prevalence of periodontal disease among women with PCOS, with significant correlations between oral health indices and hormonal/metabolic parameters. These results underscore the potential impact of systemic conditions on oral health in women with PCOS.

This study aimed to investigate the oral health outcomes in women with Polycystic Ovary Syndrome (PCOS) and explore the relationship between hormonal and metabolic parameters and periodontal health. The findings indicate a high prevalence of periodontal disease among women with PCOS, with significant correlations between elevated androgen levels, insulin resistance and periodontal indices.

The high prevalence of periodontal disease in women with PCOS observed in this study aligns with previous research suggesting a potential link between these conditions[1-2]. Hyperandrogenism and insulin resistance, common features of PCOS, may contribute to periodontal disease through mechanisms involving increased inflammation and altered immune responses [3]. Elevated androgen levels have been associated with increased production of pro-inflammatory cytokines, which can exacerbate periodontal inflammation[4].

Insulin resistance, another hallmark of PCOS, has been implicated in the pathogenesis of periodontal disease due to its role in promoting systemic inflammation and oxidative stress[5]. This study found a significant correlation between insulin resistance and the Gingival Index, supporting the hypothesis that metabolic dysregulation in PCOS can adversely affect periodontal health. Similar findings have been reported in studies examining the link between metabolic syndrome and periodontal disease[6].

The association between metabolic syndrome and increased probing depth observed in this study further underscores the impact of systemic conditions on oral health in women with PCOS. Metabolic syndrome, characterized by a cluster of metabolic abnormalities, has been linked to an increased risk of periodontal disease, potentially due to shared inflammatory pathways and dysregulated lipid metabolism[7].

These findings highlight the importance of integrated healthcare approaches that address both gynecological and dental care needs for women with PCOS. Early identification and management of oral health issues in this population may help mitigate the risk of periodontal complications and improve overall health outcomes. Healthcare providers should consider regular oral health assessments as part of the comprehensive management of women with PCOS.

This study has some limitations. The cross-sectional design precludes establishing causal relationships between PCOS and periodontal disease. Future longitudinal studies are needed to further explore the temporal relationship and underlying mechanisms between these conditions. Additionally, the study's findings may not be generalizable to all populations, as it was conducted in a single geographic location.

CONCLUSION

In conclusion, the study demonstrates a significant association between PCOS and periodontal disease, with hormonal and metabolic factors playing a crucial role in oral health outcomes. These results underscore the need for interdisciplinary collaboration in the management of women with PCOS to address both systemic and oral health concerns effectively.

REFERENCES

1. March, W.A., V.M. Moore, K.J. Willson, D.I.W. Phillips and R.J. Norman, *et al*., 2009. The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. Hum. Reprod., 25: 544-551.
2. Teede, H., A. Deeks and L. Moran, 2010. Polycystic ovary syndrome: A complex condition with psychological, reproductive and metabolic manifestations that impacts on health across the lifespan. BMC Med., Vol. 8, No. 41 .10.1186/1741-7015-8-41.

3. Goodarzi, M.O., D.A. Dumesic, G. Chazenbalk and R. Azziz, 2011. Polycystic ovary syndrome: Etiology, pathogenesis and diagnosis. Nat. Rev. Endocrinol., 7: 219-231.
4. Gürsoy, M., E. Könönen, U.K. Gürsoy, T. Tervahartiala, R. Pajukanta and T. Sorsa, 2013. Periodontal status and neutrophilic enzyme levels in gingival crevicular fluid during pregnancy and postpartum. J. Periodontology, 84: 499-505.
5. Tonetti, M.S. and D.T.E. Van 2013. Periodontitis and atherosclerotic cardiovascular disease: Consensus report of the joint EFP/AAP workshop on periodontitis and systemic diseases. J Clin Periodontol., 40: 24-29.
6. Dursun, E., F.A. Akalin, G.N. Güncü, N. Çinar and D.Y. Aksoy,et al., 2011. Periodontal disease in polycystic ovary syndrome. Fertil Steril., 95: 320-323.
7. Escobar, M.H.F., 2018. Polycystic ovary syndrome: Definition, aetiology, diagnosis and treatment. Nat. Rev. Endocrinol., 14: 270-284.
8. Yildirim, B., N. Sabir and B. Kaleli, 2013. Influence of hormones and systemic inflammation on periodontal health in patients with polycystic ovary syndrome. Int J Clin Exp Med., 6: 825-830.
9. Graziani, F., S. Cei, M. Tonetti, M. Paolantonio and R. Serio,et al., 2010. Systemic inflammation and periodontitis: A case-control study. J Clin Periodontol., 37: 688-693.