CHARACTERISTICS OF POST-NATAL PAKISTANI WOMEN WITH CHRONIC APICAL PERIODONITITIS

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ABSTRACT

Objective: The purpose of this research was to identify the characteristics of post-natal Pakistani women with Chronic Apical Periodontitis (CAP).

Material and methods: This cross-sectional study was conducted among 150 post-natal women who suffered from CAP at the Gynaecology ward, Unit III, Civil Hospital Karachi (CHK). Data were collected from women who delivered babies on the day of data collection at the Gynae ward CHK and satisfied the criteria to be included in the study. Principal Investigator assessed radiographs for the presence of CAP.

Results: Mean age of participants was 26.61±4.83. Majority 104 (69.3%) were multigravida while 46 (30. %) were primigravida. The mean gestational period in weeks was 36.16± 2.31. The majority of the participants 115 (76.7%) had CAP in a single tooth, 32 (21.3%) had in 2 teeth and 3 (2%) had CAP in 3 teeth. Periapical index (PAI) score was significantly associated with the birth type (normal term and preterm). Baby weight significantly differed between PAI scores.

Conclusion: Results of this study indicate most of the study women were illiterate and belong to a low-income families. There was a higher percentage of multigravida and most of the deliveries were normal vaginal. CAP in a single tooth was found among the majority of the study women.

Keywords: Chronic Apical Periodontitis, Post natal, periapical index

INTRODUCTION

Chronic Apical Periodontitis (CAP) has been reported to be a prevalent disease especially in adults[1,2]. Numerous researches showed that 24–61% of adults suffer from Chronic Apical Periodontitis[3]. Premature parturition difficulties are the key reason for death for children less than 5 years, resulting in more than 1 million mortality in 2015 alone. In Pakistan, approximately 17-24% of deliveries are low birth weight, regardless of time of delivery.

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Correspondingly, a Pakistani study reported that more than 80% of the new-borns weighted from 2100 to 2500 grams[4].There are various disabilities in children that are linked with preterm birth which consist of a motor and cognitive deficiency like Attention Deficit Hyperactivity Disorder (ADHD)[5]. Literature shows that out of 13 million children who survive, three percent develop moderate to severe impairments of the neurons with an additional 4.4% develops mild neurodevelopmental disabilities and around 77 million Disability Adjusted Life Years (DALYs)[6]. When compared to babies born full-term, these disabilities are two to threefolds more usual in preterm babies[7].

Researches accomplished in the field of periodontal medicine advocate that during pregnancy the periodontitis is potentially a marker for LBWPT[8,9], and regardless of considerable differences between the endodontic pathology and periodontitis, there are distinct resemblances, like the constant relation with anaerobic gram-negative

microorganisms and the discharge of increased levels of cytokines[10]. Moreover, oral cavity infections may result in the existence of bacterial products like Lipopolysaccharide or endotoxin from gram-negative microorganisms and encourage the production of cytokines, with TNF-α, IL 1- and IL-6, escalating the release of prostaglandins that may result in LBWPT[9]. Chronic Apical Periodontitis (CAP) is a condition in which an apical portion of the root of tooth is inflamed chronically which is commonly not painful. Newly, Chronic Apical Periodontitis (CAP) has been identified as one of the potential risk factors associated with LBWPT births[11-13]. Epidemiological researches exhibited the burden of CAP around the globe such as Spain, Canada, Japan, Turkey and USA[14] that a substantial number of adults are facing this situation. The burden varies from 7 to 20%[15]. The burden of CAP especially with bone lesions (mild- severe) is greater among general population particularly females, though the findings are from shorter scale studies[16-19].

Endodontics and periapical status are significant indicators that can estimate tooth survival and further requirements for dental treatment[20]. But research on the prevalence of CAP has not been conducted in the Pakistani population specifically among post-natal women so the exact burden of CAP, which is generally an asymptomatic condition, is still not known in post-natal Pakistani women. Given its relationship with low birth weight babies and premature birth, it is substantial to measure its magnitude. The lack of an adequate number of evidence warrants research on the topic especially in settings like Pakistan where both the burden of CAP and incidence of LBWPT births is high. The purpose of the current research study was to identify the characteristics of post-natal Pakistani women with Chronic Apical Periodontitis.

MATERIAL AND METHODS

This cross-sectional study was conducted at the Gynaecology ward, Unit III Civil Hospital Karachi (CHK), from September 2016 to November 2017. A total of 150 post-natal women who had Chronic Apical Periodontitis (CAP) were recruited in this study. Data were collected from women who delivered babies on that day at the Gynae ward CHK. Mothers with age group 18-49 years with healthy gums and periodontium, singleton pregnancy, delivering either through C-section or normal vaginal delivery were included in this study. Informed consent was also obtained from all study participants. As noted previously, women with following conditions, such as gestational diabetes, preterm birth, twin pregnancy, pre-eclampsia, eclampsia, post-delivery BMI less than 18.5 Kg/m2 , using antibiotics in last 4 weeks, have less than 18 teeth, are smokers, used alcohol and illegal drugs were excluded. Participants were examined for the Periodontitis by the examiner and excluded if had unhealthy gums and periodontium (Periodontitis).

CAP was labelled using Peri Apical Index (PAI) by Orstavik for the assessment of radiographs which consist of scores ranged from 1 (healthy) through 5 (severe Periodontitis).[21] Both cases and controls underwent radiography between 24-48 hours of delivery. Women having scores of 3 or more will be labelled as having CAP. Periapical radiographs of the suspected teeth (untreated caries, unsatisfactory treated and necrosed teeth) were taken for the diagnosis of CAP (except third molars) within 24-48 hours of delivery. Radiographs were assessed for the presence of CAP by the principal investigator.

Institutional Review Board of Dow University of Health Sciences granted ethical approval letter No: (IRB-730/DUHS/Approval/2016/243) to the study. For the sake of the privacy of patients, confidentiality and anonymity were made sure. The sample size was calculated through the statistical software (Sample size determination in health studies WHO). By using the prevalence of CAP as 54.5% among post-natal women with 8% Confidence limits and a 95% confidence interval.[22] The calculated required sample size was 149, however, data were taken from 150 post-natal women.

After the baby's birth and mother shifted to the room, data had been collected through questionnaires to record the information regarding demographic, pregnancy history, and new-borns data. Periapical radiographs of the suspected teeth (unsatisfactory treated, untreated caries, and necrosed teeth) were obtained for CAP diagnosis (other than third molars) within two days of delivery. Principal investigator examined radiographs for the presence of CAP. SPSS version 21.0 was used to enter and analyzed the study data. For all categorical variables frequencies and percentages were mentioned (education, age, family size, income, gravida, parity, CAP, BMI and number of teeth having CAP) and mean and the standard deviation was estimated for the quantitative variable such as age. The association between CAP and participants' characteristics were obtained with the level of significance as 5%.

RESULTS

Table 1 depicts the demographic characteristics of participants. The mean age of the study women was 26.61 ± 4.83. Among all participants 63 (42%) were unable to read or write, 53 (35.3%) were primary, 28 (18.7%) were matric and 6 (4%) were intermediate educated. There were 137 (91.3%) participants who had monthly income less than or equal 15,000 rupees and 13 (8.7%) had monthly

income more than 15,000 rupees. The majority of the participants had less than or equal to 6 members in the family while 53 (35.3%) had more than 6 family members.

Table 2 shows the gestational characteristics of enrolled women of study. Majority 104 (69.3%) were multigravida while 46 (30%) were primigravida. The mean gestational period in weeks was 36.16±2.31. The average height and weight of participating mothers were 157.24±8.86 cm and 55.26±5.45 kg respectively. The average BMI of participants was 22.42±2.35 kg/m2. The majority of women 135 (90%) had spontaneous vaginal delivery while 15 (10%) had a caesarean section. There were 72 (48%) participants who had low birth weight infants and 75(50%) were baby boys. The mean birth weight of infants was 2459.33±593.93 grams. Table 3 presented the distribution of the number of teeth having CAP and PAI scores among study participants. The majority of the participants 115 (76.7%) had CAP in single teeth, 32 (21.3%) participants had 2 teeth, and 3 (2%) had 3 teeth affected by CAP. About 97 (64.7%) postnatal women had mild CAP (score 3), 45 (30%) had moderate (score 4) while 8 (5.3%) had severe CAP (score 5). Table 4 depicts the association of PAI (Mild/Moderate/Severe) score with the type of birth, mode of delivery, number of teeth having CAP, and baby weight. Chi-square test confirmed that there PAI score was significantly associated with the type of birth (normal term and pre-term). Whereas the mode of delivery and number of teeth having CAP did not show any significance with PAI scores. Two-sample independent t-test exhibited that baby weight significantly differed between PAI scores (P-value < 0.05).

Table 1: Characteristics of post-natal Pakistani women with Chronic Apical Periodontitis (CAP)

Characteristics	Frequency (n)	Percentage (%)
Age	26.61 ± 4.83	
Education		
Unable to read or write	63	42.0
Primary	53	35.3
Matric	28	18.7
Intermediate	06	04.0
Monthly household income in Rupees	12526.66 ± 2813.43	
Income		
≤15,000 Rupees	137	91.3
> 15,000 Rupees	13	8.7
No of family members	6.34 ± 1.03	
Family size		
≤ 6 members	97	64.7
> 6 member	53	35.3

DISCUSSION

The study was conducted to assess the characteristics of Chronic Apical Periodontitis (CAP) among post-natal Pakistani women. The evaluation of CAP was dependent on standard periapical radiographs, scored by two distinct assessors therefore there were minimal chances of examiner under-reporting because periapical radiographs give fine and minute details. The PAI index can also be used on panoramic radiographs, where an increased rate of CAP is present.[22,23] Irrespective of this usual usage of the index, research reported that it can underestimate the occurrence of CAP as compared to periapical radiographs[11]. In our study, periapical radiographs are the investigation of choice compared to panoramic examination due to the better visualization of the periapi-

Table 2: Gestational characteristics of post-natal Pakistani women with Chronic Apical Periodontitis (CAP)

Characteristics	Frequency (n)	Percentage (%)
Gravida		
Primrigravida	46	30.7
Multigravida	104	69.3
Gestational period in weeks	2.31±36.16	
Mother height (cm)	8.86±157.24	
Mother weight (Kg)	5.45±55.26	
BMI (kg/m2)	2.35±22.42	
Mode of delivery		
Normal vaginal delivery	135	90.0
Caesarean	15	10.0
Baby gender		
Male	75	50.0
Female	75	50.0
Low birth weight		
No	78	52.0
Yes	72	48.0
Baby weight (grams)	593.93±2459.33	

Table 3: Gestational characteristics of post-natal Pakistani women with Chronic Apical Periodontitis (CAP)

No of teeth having CAP	Frequency (n)	Percentage(%)
1 toothhaving CAP	115	76.7
2 teeth having CAP	32	21.3
3 teeth having CAP	3	2.0
PAI Score		
3 Mild CAP (Change in bone structure with mineral loss)	97	64.7
4 Moderate CAP (well defined radiolucent area)	45	30.0
5 Severe CAP (exacerbating features)	8	5.3

Table 4: Association of PAI Score with term birth, mode of delivery, Baby weight and No. of Teeth having CAP

	PAI Score				P-value
	Mild CAP		Moderate/ Severe CAP		
	Frequency(n)	Percentage (%)	Frequency(n)	Percentage (%)	
Type of birth					
Normal term birth	57	73.10	21	26.90	0.025
Preterm birth	40	55.60	32	44.40	
Mode of delivery					
Normal vaginal delivery	88	65.20	47	34.80	0.609
Caesarean	9	60.00	6	40.00	
No of Teeth having CAP					
One tooth	77	67.00	38	33.00	0.288
>1 teeth	20	57.10	15	42.90	
Baby weight (grams)	585.44±2529.89		593.09±2330.18		0.045

cal anatomy. Moreover, this radiography procedure creates the best precision to break down apical structures of all dental gathering, specifically in the anterior district of mouth, where the radiopaque projection of the spine confuses the examination of this district[11].

Interpretation of radiographs, either panoramic or periapical or in combination, is the only method that can be employed in an epidemiological study while assessing CAP. Some research studies also incorporate clinical examination and or interview[24].

Most of the women participants (42%) in our study were unable to read and write, two-third of study women belonged to a low-income family and had a family size up to six members.

Our study showed that most of the women were illiterate. The reason behind this finding might be lack of education which leads to lower nutritional state and lack of knowledge on oral care, malpractice, and prenatal care increases the risk of low birth weight neonates. Small family size (≤ 6 members) was found to be prevalent in our study, this result was found to be consistent with the results of studies conducted in Germany and Sri Lanka[25, 26]. Our study showed that the majority of the women 104 (69.3%) were multigravida and the mean gestational period was 36.6±2.31 weeks. The majority of the deliveries (90%) was a normal vaginal delivery. Sex of the baby was evenly distributed. Furthermore, there were 48% of babies born with low birth weight. In our study, 3/4th of participants had CAP in single teeth whereas nearly two-third patients had PAI score 3 (mild CAP). PAI score was significantly associated with the type of birth (normal term and preterm). Furthermore, baby weight significantly differed between PAI scores. These findings were consistent with the study 8 that showed preterm birth and baby weight were significantly associated with periodontitis.

CONCLUSION

The results of this study indicate most of the study women were illiterate and belong to a low-income family. There was a higher percentage of multigravida and most of the deliveries were normal vaginal. CAP in a single tooth was found among the majority of the study women.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Shah H: Conceptualized the study, acquisition, collection, statistical analysis & interpretation of data, manuscript writing.

Nisar N: Proof Reading and final approval

Butt S: Data collection and editing manuscript

Ali AH: Data collection.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.