Investigating the prevalence of postpartum hair loss and its associated risk factors: a cross-sectional study

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Background: Postpartum hair loss is one of the most common childbirth complications, sharing an association with certain clinical and disease-related factors. The aim of this study was to determine the frequency of postpartum hair loss and risk factors in women referring to Yazd primary healthcare clinics.

Methods: This descriptive cross-sectional study was conducted in 2016 in four dermatology clinics in Yazd, Iran. The statistical population included all women aged 17 to 48 years who had given birth during the previous six months and attended primary healthcare clinics. Cluster sampling was performed to select the participants; 329 women visiting four clinics in Yazd were examined for hair loss and its risk factors. Study data were analyzed using SPSS software (t-test, ANOVA, and chi-squared test).

Results: The mean age of the participants was 29.29 ± 6.12 years. In this study, 68.4% of participants had postpartum hair loss. There was a statistically significant relationship between postpartum hair loss and variables such as anemia ($P = 0.001$), breastfeeding ($P = 0.002$), nocturnal feeding ($P = 0.001$), gestational diabetes ($P = 0.019$), history of hypothyroidism ($P = 0.001$), and stress before and during delivery ($P = 0.001$ for both).

Conclusions: This study revealed that a history of hair loss, breastfeeding, gestational diabetes, and stress could affect postpartum hair loss. Therefore, these factors might be used as hair loss predictors in women undergoing pregnancy.

Keywords: postpartum period, alopecia, pregnancy

INTRODUCTION

Hair loss is the most common dermatologic complaint after delivery [1]. In the natural hair growth cycle, the daily shedding of 100-150 telogen club hair is normal [2]. The follicles usually retain telogen hair until they enter the anagen phase again [3]. Normally, 90-95% of head hair follicles are in the anagen phase, while others are in the telogen phase [2]. Telogen effluvium (TE) is diffuse hair loss on the scalp that usually starts three months after its trigger. It lasts for about six months and usually involves less than 50% of the scalp hair [3]. Follicles remain in the anagen phase during pregnancy but enter the catagen and telogen phases after delivery. Therefore, the clinical manifestation of hair loss usually appears three months after delivery. There is a probability that up to 60% of hair follicles in the anagen phase enter the telogen phase. Postpartum hair loss is temporary and disappears steadily after 6-12 weeks [4,5].

Studies have shown that endocrine dysfunction and hormonal changes during pregnancy and after delivery [6-8], iron deficiency due to blood

loss during labor [9], the increase in anagen phase during pregnancy, and the increase in telogen phase after delivery are associated with postpartum hair loss [4]. To the best of our knowledge, there is no definite treatment for TE, and it is a self-limited condition after which all lost hair will gradually be replaced [10]. If hair loss is caused by stress, identifying and managing stress may help prevent and treat hair loss [11]. Postpartum hair loss affects mothers' psychosocial state and daily activities [12]. Therefore, identifying the causes and risk factors associated with postpartum hair loss may help to relieve this burden. Thus, this study was conducted to clarify the prevalence of postpartum hair loss and its risk factors among mothers attending primary healthcare clinics in Yazd, Iran, during 2016.

METHOD AND MATERIAL

Participants and study design

We performed this descriptive cross-sectional study to find the prevalence and factors affecting postpartum hair loss in mothers. Cluster sampling was performed to select the participants. The statistical population included all women aged 17 to 48 years who gave birth during the previous six months then attended primary healthcare clinics in Yazd, Iran. All women who met these criteria and were willing to participate in this study were included. However, women who suffered from androgenetic alopecia, alopecia areata, or trichotillomania were excluded. Finally, 329 postpartum women who attended four primary healthcare clinics (Akbarabad: 85, Maryamabad: 82, Rahmatabad: 82, and Shahvali: 82) in Yazd were examined for hair loss and its risk factors.

Clinical assessment

Demographic and clinical information were collected through patient interviews and were recorded in data collection forms. The collected data included parity and gravity, maternal age at each pregnancy, type of delivery, sex of the child, child's birth weight, newborn hair density, breastfeeding pattern, stress during pregnancy and childbirth, history of hypothyroidism (TSH > 2.5), gestational diabetes (fasting blood sugar ≥ 95 mg/dl), gestational hypertension (systolic blood pressure

≥ 140 mmHg), and anemia (hemoglobin < 12 mg/dl), time of onset of hair loss, severity of hair loss, and hereditary history of hair loss. Then, all women were asked to wash and comb their hair before attending a physical examination on the subsequent day. Finally, each woman's scalp was examined, and the amount of hair loss was estimated by the physician using the pull test.

Statistical methods

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 22 (SPSS Inc., Chicago, USA). Categorical variables were compared using Fisher's exact test or the chi-squared test, while continuous variables were compared using the student t-test or ANOVA. Univariate analyses and multivariate analyses were performed. Data were presented as mean ± standard deviation (SD) for continuous variables, and P-values < 0.05 were considered statistically significant.

Ethical considerations

The study protocol was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences, and written informed consent was obtained from each subject prior to their participation.

RESULTS

The mean age of the participants was 29.29 ± 6.12 years old (range: 17 to 48 years). Out of 329 participants, 139 (42.2%) had first gravity, 117 (35.5%) for the second time, and 73(22.3%) for the third or more times. The mean birth weight of newborns was 3.04 ± 0.51 kg.

There was no statistically significant relationship between postpartum hair loss and variables such as type of delivery ($P = 0.172$), maternal age ($P = 0.402$), number of pregnancies ($P = 0.083$), child gender ($P = 0.305$), gestational hypertension ($P = 0.697$), and newborn hair density ($P = 0.665$) (Table 1). However, factors such as newborn's weight, anemia ($P = 0.001$), breastfeeding ($P = 0.002$), nocturnal feeding ($P = 0.001$), gestational diabetes ($P = 0.019$), history of hypothyroidism ($P = 0.001$), and stress before and during delivery ($P = 0.00$ for

Table 1. Frequency of descriptive variables among the participants

Variable	Number (%)	Postpartum hair loss (%)		P
		Yes	No	
Type of delivery				
Vaginal	178 (53.1)	116 (65.2)	62	0.172
Cesarean	151 (46.9)	109 (72.2)	42	
Night breastfeeding				
Yes	266 (80.9)	203 (76.3)	63	0.001
No	63 (19.1)	22 (34.9)	41	
Breast feeding				
Yes	96 (29.2)	54 (56.3)	42	0.002
No	233 (70.8)	171 (73.4)	62	
Gestational diabetes				
Yes	66 (20.1)	53 (80.3)	13	0.019
No	263 (79.9)	172 (65.4)	91	
History of thyroid disease				
Yes	49 (15)	33 (68)	16	0.001
No	280 (85)	100 (36)	180	
Anemia				
Yes	173 (52.6)	140 (80.9)	33	0.001
No	156 (47.4)	85 (54.5)	71	
Gestational HTN				
Yes	38 (11.6)	27 (71.1)	11	0.697
No	291 (88.4)	198 (68)	93	
History of stress				
Yes	188 (57.1)	156 (83)	32	0.001
No	141 (42.9)	69 (48.9)	72	
Stress during delivery				
Yes	208 (63.2)	166 (79.8)	42	0.001
No	121 (36.8)	59 (48.8)	62	

both) had a significant effect on postpartum hair loss (Table 1).

The study results showed that 32.2% of participants had hair loss before pregnancy, 43.2% had hair loss during pregnancy, and 68.4% had hair loss after delivery. Among those who had hair loss after delivery, 56 experienced hair loss after one month, 101 after two months, 39 after three months, 11 after four months, and 18 after five months. The mean time of hair loss after delivery was 3.26 ± 0.43 months. There was a significant relationship between postpartum hair loss and hair loss before and during pregnancy (P = 0.001). In addition, there was a significant relationship between hair loss after delivery and hair loss in the previous pregnancy (P = 0.001), but the family history of hair loss did not significantly correlate with postpartum hair loss (P = 0.121) (Table 2).

DISCUSSION

This study was performed to investigate the frequency and risk factors of postpartum hair loss. The study population included women visiting Yazd primary healthcare clinics during 2016. The study sample included 329 postpartum women. The mean age of the participants was 29.29 ± 6.12 years old, and the mean birth weight of the newborns was 3.04 ± 0.51 kg.

Gizlenti et al. showed that the duration of the anagen phase in postpartum women was significantly shorter than that in pregnant women at six and nine months of gestation, while the average duration of the telogen phase in postpartum was longer. They also found that the mean anagen phase was longer in breastfeeding women compared with non-breastfeeding women, but this was not statistically significant [4]; in our study, the rate of hair loss after delivery was significantly higher in breastfeeding women.

Gizlenti et al. also noted that the peak of hair loss after delivery was the second and third months after childbirth. In the present study, 140 participants experienced hair loss in the second

Table 2. Frequency distribution of hair loss in participants

Variable	Number (%)	Postpartum hair loss (%)		P
		Yes	No	
Hair loss before pregnancy				
No	223 (67.8)	129 (59.7)	94	0.001
Yes	106 (32.3)	96 (90.6)	10	
Hair loss during pregnancy				
No	187 (56.8)	95 (50.8)	92	0.001
Yes	142 (43.2)	130 (91.5)	12	
Hair loss severity				
Mild	108 (32.8)	108 (48)		0.24
Moderate	73 (22.2)	73 (32.5)		
Severe	44 (13.4)	44 (19.5)		
No hair loss	104 (31.6)	104 (31.6)		
Hair loss in previous pregnancy				
No	230 (69.9)	95 (58.7)	135	0.001
Yes	99 (30.1)	90 (90)	9	
Familial history				
No	221 (67.2)	145 (68)	76	0.121
Yes	108 (32.8)	80 (71.1)	28	
Infantile hair density				
Good	232 (70.5)	157 (67.7)	75	0.665
Poor	97 (29.5)	68 (70.1)	29	

and third months, while hair loss was reported less later. This period can last up to six months after childbirth, which can be prolonged depending on the length of the catagen-telogen phase in different individuals [4].

Bencel *et al.* revealed that the family history of hair loss did not significantly affect postpartum hair loss. According to their study, 88.7% of participants had hair loss between the eighth and sixteenth weeks after childbirth, which is consistent with the findings of this study and other studies [13]. The results of Yelva's study also showed that the rate of postpartum hair loss increased two to four months after childbirth [14].

The present study showed that the frequency of postpartum hair loss was significantly higher in mothers with risk factors such as anemia, gestational diabetes, and a history of hypothyroidism, consistent with the findings of a study by Trost [9]. In the majority of studies, anemia was represented as an effective factor in hair loss and its treatment in all cases [15,16]. Rushton revealed that the rate of hair loss in people who received iron supplements significantly decreased in an interventional study [17].

Findings from the research of Gizlenti *et al.* in 2014 showed that there is a significant relationship between gestational diabetes and hair loss. There are few studies in this regard, but the findings of Gizlenti *et al.* concluded that stress, endocrine disorders, and especially autoimmune diseases could lead to hair loss in mothers [4]. The results of this study are consistent with our findings.

Beurey *et al.* demonstrated that blood pressure during pregnancy, eclampsia, and preeclampsia significantly affected hair loss after delivery. This finding contrasts with that found in the present study [18]. In addition, Eastham suggested no significant relationship between hypertension during pregnancy and hair loss. This discrepancy between the findings of existing studies can be due to the presence of various confounding factors in the studies [19].

Newborn hair density is indicative of the levels of hormones available for hair growth. In the present study, there was no significant relationship between newborn hair density and mother's hair loss, while in the Beurey *et al.*'s study, prenatal premature hair density was significantly associated with mother's hair loss. This controversy may be due to individual differences between different communities [18]. As the study limitation, the lack of examining long-term maternal behaviors through a longitudinal study design is noted. Also, designing studies in this field in rural areas where lifestyle training is limited may provide useful findings. In addition, the investigation of risk factors such

as obesity, maternal nutritional status, gestational age, and occupation is recommended.

CONCLUSION

Postpartum hair loss is a serious problem for women. Various factors such as newborn's weight, anemia, gestational diabetes and stress, history of hypothyroidism, history of hair loss in previous pregnancies, and history of hair loss before and during pregnancy influence its severity. Our study also showed that breastfeeding and nocturnal breastfeeding affect postpartum hair loss. Creating an appropriate environment for reducing stress among mothers and training them to control stress can positively affect the management of postpartum hair loss. Hair loss in mothers increases the possibility of creating psychological uneasiness in them due to the loss of beauty; therefore, we can prevent potential problems by finding mothers exposed to postpartum hair loss and promptly providing treatment. We recommend controlling pregnancy-related diseases (e.g., diabetes), developing lifestyle interventions for mothers, controlling stress during pregnancy, and following up on mothers during pregnancy.

Conflict of Interest: None declared.

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