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Original Article

Salmon Patch and Mongolian Spot Frequency in the Northwest of Iran: A Descriptive Study

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ABSTRACT

***Background*:** Cutaneous manifestations are commonly observed in the neonatal period. It is important to differentiate physiologic skin lesions from pathologic ones to avoid parents' concerns. Regarding this, the current study aimed to investigate the frequency and localization of salmon patch (SP) and Mongolian spot (MS) in Iranian newborns to assess the potential relationship between the neonatal and maternal characteristics.

***Methods*:** This descriptive cross-sectional study was conducted on one thousand healthy infants born at Al-Zahra University Hospital in the northwest of Iran during August-September 2014. For the aims of the study, the neonates were examined by a pediatrician. The collected data included gender, gestational age, anatomical sites of the lesions (MS and SP), birth weight of the newborns, parental consanguinity, parity, and maternal age. The exclusion criteria included major known congenital chromosomal or metabolic abnormalities, stillbirths, and admission in the Sick Newborn Care Unit or Neonatal Intensive Care Unit.

***Results*:** According to the results of this study, the frequency rates of MS and SP among 1000 newborns were found to be 32.3% and 14.5%, respectively. Maternal age was the only variable which showed a statistically significant relationship with SP (P=0.024). In addition, sacral region and upper eyelid were found to be the most common site of MS and SP involvement, respectively.

Conclusion: MS and SP which are commonly observed in the routine neonatal examination may worry parents regardless of their association with an underlying systemic disorder. Regarding this, we recommend careful examination of the newborns' skin by pediatrician in the neonatal wards.

Keywords: Mongolian spot, Newborn, Salmon patch

Introduction

The newborn or neonatal period generally describes the first four weeks postnatal period (1), whereas infancy is the first year of life (2). Cutaneous manifestations are commonly detected in neonatal period and with variety of presentations in a wide geographic areas and ethnic groups (2, 3). Many studies have been performed in different countries to determine the prevalence of neonatal skin lesions across various racial groups.

In the Iranian neonates, pigmented birthmarks, particularly Mongolian blue spots, were demo-nstrated to be the most frequent cutaneous manifestation with a frequency of 71.3% (1). They have a spectrum of transient self-limited benign physiologic lesions to serious pathologic dermatoses (4).Therefore, appropriate identi-fication of these lesions is important in reducing the parents', caregivers', and primary health providers' concern.

The aim of this study was to investigate the frequency and localization of salmon patch (SP) and Mongolian spot (MS) in Iranian newborns born at AL-Zahra University Hospital, Tabriz, Iran, to assess the probable relationship between the neonatal and maternal characteristics.

Methods

This hospital-based, descriptive cross-sectional study was conducted at Al-Zahra University Hospital in Tabriz (a city in the northwest of Iran and the capital city of East Azerbaijan province). This tertiary referral hospital is a primary gynecology and obstetrics department providing care services to nineteen districts. This study protocol was reviewed and approved by hospital ethical committee. Following the literature, the sample size was determined to be one thousand newborns. To this aim, all consecutive live births born by any mode of delivery from all socioeco-nomic classes at the hospital from August-September 2014 were

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recruited into the study until the number of study population accomplished.

Before the examination, the parents' informed consents were obtained. Subsequently, a questionnaire was filled in by the pediatrician in the first two days postpartum, while the parents were present in the examination room. The collected data included gender, gestational age, anatomical sites of the lesions, birth weight, parental consanguinity, parity, and maternal age. The neonates were categorized by their birth weight as ≤ 2500, 2500-4000, and ≥ 4000 g. Furthermore, maternal age was categorized as ≤ 18, 19-35 and ≥ 36 years.

The exclusion criteria consisted of newborns with major known congenital chromosomal or metabolic abnormalities, stillbirths, and admission in the Sick Newborn Care Unit or Neonatal Intensive Care Unit (NICU).

For the purpose of the study, the neonates were examined for two common pigmented and vascular birthmarks including MS and SP, respectively.

The categorical variables were analyzed with Chi-square and Fisher's exact tests by SPSS 17. P-value less than 0.05 was considered statistically significant.

Results

According to the results of the study, out of one thousand newborns examined during the study period, 919 cases (91.9%) were born at term and post-term and 81 neonates (8.1%) were preterm. In addition, 484 (48.4%) infants were male and 516 (51.6%) cases were female. The frequency rates of MS and SP were found to be 32.3% and 14.5%, respectively. Besides, the consanguinity was observed in 10.1% of the parents. The characteristics of the newborns and their mothers regarding the two birthmarks are shown in Tables 1 and 2. Out of the examined variables, the maternal age was the only feature which demonstrated a statistically significant relationship with SP (P=0.024).

MS appeared as patchy areas of blue-grey hyperpigmentation, mostly involving sacral (83.8%) and lumbosacral (37.2%) regions. SP (nevus simplex) appeared as a small, pale pink, ill-defined macule, mostly involving upper eyelid (82.8%). Other anatomical sites of these birthmarks are shown in Tables 3 and 4.

Discussion

Dermal manifestations are common birthmarks in neonatal period, which can provoke parental concerns regardless of their association with an underlying systemic disorder. Many of these birthmarks are transient, self-limited, and benign physiological lesions; however, they can also be serious pathologic lesions requiring further workup and evaluation (4, 5).Therefore, a primary and important step during the examination of a newborn is differentiating benign self-limited dermal lesions from the serious ones.

In the present study, all the neonates born in the Obstetrics and Gynecology Department of Al-Zahra University Hospital were observed and examined

Table1. The relationship between Mongolian spot frequency and neonatal and maternal characteristics

Characteristics		Mongolian Spot						
		Present		Absent		Total		
		N	%	N	%	N	%	P
Neonate gender	Male	150	31	334	69	484	48.4	0.390
	Female	173	33.5	343	66.5	516	51.6	
Gestational Age	Term	304	33.1	615	66.9	919	91.9	0.076
	Preterm	19	23.5	62	76.5	81	8.1	
Parity	One	123	30.6	279	69.4	402	40.2	
	Two	129	31.6	279	69.4	408	40.8	
	≥3	71	37.4	119	69.6	190	19	0.240
Consanguinity	Yes	14	13.9	87	96.1	101	10.1	
	No	131	14.6	768	85.4	899	89.9	0.087
Birth Weight (gr)	≤2500	14	22.6	48	77.4	62	6.2	
	2500-4000	28.3	32.4	591	67.6	874	87.4	
	≥4000	26	40.6	38	56.4	64	6.4	0.094
Maternal Age (y)	≤18	9	18.8	39	82.2	48	4.8	
	19-35	272	32.7	560	67.3	832	83.2	
	≥36	42	35	78	65	120	12	0.100

Table 2. The relationship between salmon patches frequency and neonatal and maternal characteristics

Characteristics		Salmon patches						
		Present		Absent		Total		
		n	%	n	%	n	%	P
Gender	Male	65	13.4	419	86.6	484	48.4	0.350
	Female	80	15.5	436	84.5	516	51.6	
Gestational age	Term	137	14.9	782	85.1	919	91.9	0.200
	Preterm	8	9.9	73	96.1	81	8.1	
Parity	One	57	14.2	345	85.8	402	40.2	
	Two	59	14.5	349	85.5	408	40.8	
	≥3	29	15.3	161	84.7	190	19	0.900
Consanguinity	Yes	14	13.9	87	86.1	101	10.1	
	No	131	14.2	867	85.4	899	89.9	0.840
Birth weight (g)	≤2500	7	11.3	55	88.7	62	6.2	
	2500-4000	128	14.6	746	85.4	874	87.4	
	≥4000	10	15.6	54	84.4	64	6.4	0.700
Maternal age (y)	≤18	4	8.3	44	91.5	48	4.8	
	19-35	132	15.9	700	84.1	832	83.2	
	≥36	9	7.5	111	92.5	120	12	0.024

Table 3. Frequency of Mongolian spots based on anatomical distribution

Mongolian spots		
Anatomical site	N	%
Sacral	269	83.3
Lumbar	120	37.3
Gluteal	83	25.7
Lower extremities	16	4.9
Back	11	3.4
Upper extremities	3	0.9
Total	502	155.5*

* Total is above 100% because there were cases with more than one spot in different anatomical sites.

Table 4. Frequency of salmon patches based on anatomical distribution

Salmon patches		
Anatomical site	N	%
Upper eyelid	120	82.8
Frontal	35	24.1
Nose	18	12.4
Lips	13	9
Back of head and neck	11	7.6
Total	194	136.2*

* Total is above 100% because there were cases with more than one patch in different anatomical sites.

for two common pigmented and vascular birthmarks including MS and SP, respectively. Several studies reported the prevalence of neonatal birthmarks to be 57-99.3% across various racial and ethnic groups (6-10).

Out of one thousand neonates examined in this study, 32.3% and 14.4% cases were observed to have MS and SP, respectively. However, the frequency of MS was reported to be over 90% among native American and Asian infants (11-14). On the other hand, in a study conducted in Turkey, the frequency of MS among children in the Aegean Region was reported to be 26 % (15), which is close to that of our newborns. In total, the MS frequency reported in different studies varies a lot. The prevalence rates of this birthmark are reported to be 25% in Australia, 7% in Jews, 12% in Arabic countries 13-25% in Turkey (15), 75% in Nigeria, 50% in Brazil, 80% in Japan, 62% in Taiwaese, and 86-100% in China (16).

Regarding this, MS represents a good case of a clear difference between the races as its frequency ranges from 0.1% in Finland to 100% in Asia (6-8, 10, 13-16). This frequency varies from 10% to 70% in the Iranian neonates (16). In a study conducted in the southwest of Iran by Moosavi (1), the prevalence of MS was demonstrated to be 71.3%, representing much higher than what we found in the northwest of the country, perhaps secondary to the higher frequency of the Arab race in the southwest of Iran. In addition, in a study conducted in the northeast of Iran (17), the prevalence rate of MS was 17.1%. In another study by Khoshnevisasl (18), the prevalence rate was reported to be 56%. Moreover, in a study carried out in two different hospitals of Tehran, Iran, by Ashrafi (14), MS were found in 11.4% and 37.3% of the newborns in Shariati and Lolagar hospitals, respectively.

The results of the present study demonstrated that 14.4% of the neonates had SP; this frequency is relatively low, compared to reports of other studies

conducted in Iran and the other countries. The frequency rates of SP were 22.3%, 28.4%, 23.1%, 26.2%, 27.8%, 33.8%, and 19.2% in the Japanese (7), Indians (12), Italians (19), Americans (4), Taiwanese (6), Australians (20), and Turks (21), respectively. In a study by Shih, SP was reported to be the most common vascular birthmark (6). In general, the literature review demonstrated a frequency rate of 19.2-70% for SP among the white population and Asians (21-25).

In the Iranian studies, the frequency rates reported for SP are 23.3% in Mashhad (northeast of Iran) (17), 24.6% in Zanjan (18), 26.2% in Ahvaz (southwest of Iran) (1), and 52% in Tehran (23). This discrepancy may be due to racial, ethnic, and geographic diversity. Consequently, these factors play an important role in the prevalence of MS and SP not only all over the world, but also the different cities of one country and ever inside the same city. Besides, other studies found a higher prevalence of SP in the white infants, compared to the black or Asian neonates (4, 26). One reason for such differences can be referred to the easier observation of the lesions on the lighter skin. One of the limitations of our study is that the majority of the recruited neonates had light skin.

According to the results of the study, gender variation showed that MS were more prevalent among females (51.6%) than males (48.4%). This finding is inconsistent with an Iranian study carried out by Shajari et al. (23) who reported a slightly higher prevalence in males (52%) than females (48%). Similarly, in another study conducted on Chinese newborns, Leung AK demonstrated that 58% males and 53.3% females had MS (24). This difference may be due to the short duration of our study. In the current study, no statistically significant difference was observed in the distribution of MS between males and females (P=0.390); however, in Tahseen's study (25), a statistically significant difference was found, in this regard.

The prevalence of SP is high, occurring in almost half of all newborns. However, this prevalence has been demonstrated to be slightly higher in females (26). Likewise, the current study showed that females had higher prevalence (51.6%) of SP than males (48.4%); thus, this difference was not statistically significant (P= 0.350). Female preponderance in vascular birthmarks including SP was also noted in a Japanese survey (7). Similarly, an Iranian study (17) showed that SP was significantly more frequent among female newborns (P= 0.03). Besides, Shih (6), Hidano (7), and Kahana (9) reported higher incidence of SP in females; however, the difference was not significant.

With respect to gestational age and birth weight, both of lesions were commonly seen in term and heavier newborns, compared to preterm and low birth weight neonates; nevertheless, no statistically significant difference was observed. Our results confirm those of Ferahbas et al. (21) in Turkey and Sachdeva et al. (8) in India that vascular birthmarks including SP is more common in term or post-term infants with a heavier birthweight. Likewise, an Iranian study (17) obtained similar findings; however, the difference was not significant (P=0.76). Shih (6) also showed the higher incidence of SP among term versus preterm infants (P=0.96). It is possible that the development of the lesions take place in the last weeks of gestation; therefore, they are observed less in the preterm neonates.

In the current study, maternal age was the only variable, which showed a statistically significant relationship with SP (P=0.024). This finding is consistent with the results of a study carried out in Italy by Boccardi et al. (19). Our observation showed that SP and MS were more prevalent in infants from primiparous or the second parity; however, this finding differs from those of other studies in which a lower frequency of salmon patch was observed in primipara (8).

Lesions often appear in multiple sites, in this study, most of the isolated SPs were observed on the upper eyelids followed by the forehead, nose, lips, and back of head and nape. In a study on SP, the most commonly affected sites were the nape of the neck, the glabella, and the eyelids (27). In an Iranian study, the most common sites of SPs were the eyelids followed by the neck, glabella, upper lip, and lumbosacral area, respectively (17). Shih also reported eyelids as the most common site for SP followed by the nape and forehead (6). On the contrary, in another study, SP was commonly observed on the nape, head, and face, respectively (17).

In this study, most of the isolated MSs were on the sacral region followed by lumbar and gluteal regions, lower extremities, and back and upper extremities. In a Turkish study, the lumbosacral area was the most common site of MS (15). Similarly, Tsai et al. reported MS to be localized in the sacrococcygeal area in the majority of children (17). Among Chinese children, the most common sites of MSs were sacrococcygeal, gluteal, and lumbar, in order of frequency (16).

The main limitation of the present study was short duration of study and subsequently the small sample size. Moreover, other neonatal cutaneous

lesions were not investigated in our study.

Conclusion

MS and SP, which are commonly observed in the first neonatal examination, may worry parents regardless of their association with an underlying systemic disorder. Therefore, it is essential to gain knowledge about the various shapes and sites of these lesions as well as their frequency in population, both to facilitate the diagnosis and to eliminate the parental concerns. The parents can be ensured for appropriate prognosis of these dermal manifestations. The prevalence of these lesions differs with racial, geographic, and environmental factors. However, additional studies about various factors like maternal medical and nutritional history may be helpful.

Acknowledgments

None

Conflicts of interests

The authors declare no conflicts of interest.

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