

The Dermoscopic Patterns and Evolution of Acquired Melanocytic Nevi in Pediatric Age Group

Pediatric Yaş Grubunda Kazanılmış Melanositik Nevusların Dermoskopik Yapıları ve Gelişimleri

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Öz

Amaç: Pediatric yaş dönemi neovogenez için dinamik bir yapıya sahip olup nevus gelişimi için önemli ip uçlarını bünyesinde barındırmaktadır. Bu çalışmada pediatric yaş grubunda kazanılmış melanositik nevuslerin dermoskopik patern ve pigment ağ yapıları incelenerek banal ve atipik yapıli nevusların tanınmasına katkı sağlanması amaçlanmıştır.

Hastalar ve Yöntem: Çalışmamız haziran 2011- 2013 tarihleri arasında yapılmış prospektif bir çalışmadır. Çalışmaya neovogenez için yatkınlığı bulunmayan 150 pediatric gönüllü dahil edilmiştir. Çocuklar 7 yaş ve altı ve 8 yaş ve üstü olarak iki gruba ayrılmıştır. Muayene edilen nevuslerden gövde ve ekstremite yerleşimli nevuslerin sayı, boyut, patern ve pigment yapıları incelenmiştir.

Bulgular: Nevus sayı ortalaması büyük yaş grubunda (9,72) küçük yaş grubundan (3,44) daha fazla olduğu izlendi. Her iki grupta da predominant patern yapısının globuler patern olduğu, 8 yaş ve üstü grubunda retiküler paterne sahip nevusların 7 yaş ve altı grubundan daha fazla olduğu izlendi (p=0,03). Her iki grupta da globuler paterne sahip nevusların gövdede, retiküler paterne sahip nevusların ekstremite de daha yoğun olduğu izlendi (p=0,001). Nevuslerin pigment ağ yapıları incelendiğinde en sık izlenen pigment ağ yapısı uniform olmakla birlikte 8 yaş ve üstü grupta santral pigmentasyon değişikliği bulunan nevusların daha fazla izlendiği görüldü (p=0,001).

Sonuç: Pediatric yaş grubunda kazanılmış melanositik nevusler sıklıkla globüler patern ve uniform pigment ağ yapısına sahip olsa da artan yaş ile birlikte retiküler paterne ve santral pigmentasyon değişikliğine sahip nevus sayısı artmaktadır.

Anahtar Kelimeler: Atipik nevus, dermoskopi, gelişim, nevus, patern yapısı, pigment ağ

Abstract

Aim: Pediatric age period has a dynamic structure for neovogenesis. In this paper, it was aimed to contribute to recognition of banal and atypical nevi through examining dermoscopic pattern and pigment network structures of acquired melanocytic nevi in pediatric age group.

Patients and Methods: Our study was a prospective conducted between june 2011 and june 2013. One hundred and fifty pediatric volunteers who were not predisposed to neovogenesis were included in the study. Children were divided into two groups as 7 and under, and 8 and over.

Results: It was observed that the mean number of nevus was higher in the older age group (9.72) than in the younger age group (3.44). It was observed that the predominant pattern structure was globular pattern in both groups, and nevi with reticular paterne in the age group of 8 and above were more than the age group 7 and below (p = 0.03). In both groups, nevi with globular pattern were found to be denser in the trunk and nevi with reticular paterne in the extremities (p = 0.001). When the pigment network structures of nevi were examined, it was observed that the most frequently observed pigment network was uniform, but nevi with central pigmentation changes were observed more frequently in the age group of 8 years and older (p = 0.001).

Conclusion: Although acquired melanocytic nevi in the pediatric age group often have a globular pattern and uniform pigment network, the number of nevi with reticular pattern and central pigmentation changes increases with increasing age.

Key words: Atypical nevus, Dermoscopy, Evolution, Nevus, Pattern structure, Pigment network

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INTRODUCTION

Acquired melanocytic nevi are neoplasms that begin to form after birth, and the presence of irregular morphology is known to pose a risk for melanoma development (1). Primary cutaneous malignant melanoma arising from melanocytic cells of the skin accounts for 3% of all skin cancers and 75% of skin cancer-related deaths (2). With the introduction of dermoscopy, which provides a more detailed examination as compared to the examination with the naked eye, the diagnosis of malignant melanoma has been facilitated and the early clinical diagnosis rates have increased (3). Although dermoscopy is a key technique in the evaluation of melanocytic lesions, individual differences such as the age of the patient, skin phototype, and dominant nevus pattern are important for the decision about the melanocytic lesion (4). Six dermoscopic morphologies (reticular homogenous, reticular, globular-homogeneous, globular-reticular, globular, homogeneous) and six pigment networks (uniform, central hyperpigmentation, central hypopigmentation, peripheral hyperpigmentation, peripheral hypopigmentation, multifocal hyperpigmentation) have been defined for acquired melanocytic nevus dermoscopic sub-structure (5).

Studies have shown that childhood and adolescence are dynamic periods for the emergence of nevi and changes in their structures (6,7). In this study, it was aimed to contribute to the recognition of banal and atypical nevi by examining the pattern and pigment network structures of melanocytic nevi in different body localizations in the pediatric age group.

PATIENTS AND METHODS

Our study was a prospective conducted between June 2011 and June 2013. One hundred and fifty volunteers aged between 1 and 18, who were admitted to dermatology outpatient clinic due to non-nevus complaints and their healthy relatives, who had acquired melanocytic nevi were included in the study

after ethics committee approval (2011/52) had been obtained. The volunteers were divided to two groups according to the basal age of adolescence, 8, as the ones 7 years and below, and the ones 8 years and above (8). The patients who had genetic or systemic disorders that could precipitate nevus development were excluded.

Nevi were examined using a digital dermoscope (Molemax III, derma instruments, Vienna, Austria), which can provide 30x magnification. At the end of the study, the patterns of nevi located on the trunk, upper and lower extremities (excluding the palm of the foot) (globular, reticular, globular-reticular, homogeneous, reticular-homogeneous, globular-homogeneous formation) and pigment networks (uniform, central hyperpigmentation, central hypopigmentation, peripheral hyperpigmentation, peripheral hypopigmentation) were evaluated and recorded. Since the nevi in the head and neck region and the palms and soles have a distinct pattern specific to their localization, they were not included in the pattern and pigment network examination.

Statistical Analysis

SPSS 15 program was used for data assessment. Descriptive data were expressed as number, percent for categorical variables, and continuous variables were presented with mean \pm standard deviation and median (max-min). In the comparison of continuous data, Mann Whitney U Test, Kruskal Wallis Variance Analysis and Wilcoxon Signed Ranks Test were used because the data did not conform to normal distribution. Chi-square significance test was used in comparison of categorical variables, and a value of $p < 0.05$ was considered statistically significant.

RESULTS

One hundred and fifty children under the age of 18 were included in our study. Children were divided into two groups as the ones aged 7 and below, and

Table 1. Demographic characteristics of the volunteers

	Group 7 \geq	Group 8 \leq	
Age			
Mean \pm SD	4.59 \pm 1.6	12.13 \pm 2.58	
Median(Min; max)	5.00(2;7)	12.00(8;18)	
Gender			
Female	39(52%)	50(66.7%)	
Male	36(48%)	25(33.3%)	P=0.24
Skin phenotype			
Phenotype II	47(62.7%)	28(37.3%)	
Phenotype III	45(60%)	30(40%)	P=0.41

age 8 and above. There was no difference between the skin phenotype and gender distribution of the volunteers in the groups, and the epidemiological data and the number of nevi are shown in Table 1. In the dermatological examination, a total of 987 nevi were detected in the head, neck and extremities, palm soles, including the trunk. While the average number of nevi in the age group of 7 and below was 3.44, the average number of nevi in the age group 8 and over was 9.72, and it was found that the number of nevi increased with increasing age ($p < 0.001$).

A total of 845 nevi located on the trunk and extremities (185 nevi in the age group 7 and below, 660 in the age group 8 and over) were examined to determine pattern and pigment network structures. The distribution and sizes of nevi of the volunteers are given in Table 2. It was observed that the predominant pattern structure was globular in both groups, and nevi with reticular pattern were higher in the 8 and above group than in the 7 and below age group ($p = 0.03$) (Table 3). In both groups, nevi with globular pattern were found to be denser on the trunk and nevi with reticular pattern on the extremities ($p = 0.001$). When the pigment network structures of the nevi were examined, it was observed that the most frequently observed pigment network was uniform, but nevi with central pigmentation changes were observed more in the age group of 8 years and older ($p = 0.001$) (Table 4).

DISCUSSION

Our study was conducted with children under the age of 18, and the preadolescent and adolescent periods, in which nevus development and differentiation are observed intensely, are evaluated separately and the pattern and pigment structures of nevi in different anatomical locations are examined.

In our study, while the mean number of nevi was 3.44 in the younger age group, it was 9.72 in the older age group. It was observed that nevi were

mostly located in the trunk and the number of nevi was higher in the older age group than in the younger age group. In previous studies with children, it was reported that the number of nevi increased with age (9-13). In the study of Öztaş et al. (9) conducted with children aged between 0 and 16, they reported the mean number of nevi as 2.94 in children under the age of 6 and 9.88 in children over 7 years old. Aguilera et al. (11) reported the mean number of nevi as 17.5 in all children and 30 in children aged 12-15 in their study conducted with children aged 1-15 years. Valiukeviciene et al. (12) reported that the number of nevi increased in adolescence, Scope et al. (13) reported that at least one new nevus developed in approximately three quarters of the children in the 3-year follow-up of 11-year-old children. Studies indicating an increase in melanocytic nevi with growth hormone replacement and the presence of estrogen receptors in nevi in children with Turner's syndrome show that the nevus number and hormonal factors may be related (14-16). In a study conducted with children aged 8-10 years in Spain, it was reported that there were more nevi in the trunk localization than the extremities and this was attributed to the nevocytic effect of intermittent sun exposure (17). In our study, it was found that the average nevus size of the 7 and below age group was smaller than the 8 and over age group. Histological findings of atypia can be observed in the histopathological examination of nevi that show growth in elderly individuals, but histologically no findings of atypia are observed in samples obtained from excision of growing nevi in children and adolescents (18).

In our study, presence of nevi with globular pattern was dominant in both age groups. It was observed that nevi with reticular pattern increased in the age group of 8 years and older. In addition, it was observed that the nevi in the trunk localization were often globular and the nevi located in the extremities had more reticular pattern. Öztaş et al. (9) reported that the most common

Table 2. Location, number and size of the nevi

	Group 7 \geq	Group 8 \leq	
Location			
Head and neck n(%)	71(27.5)	67(9.2)	
Trunk n(%)	88(34.1)	314(43.1)	
Upper extremity n(%)	51(19.7)	254(34.8)	
Lower extremity n(%)	46(17.8)	92(12.6)	
Acral region n(%)	2(0.8)	2(0.2)	
Total nevus count/mean	258/3.44	729/9.72	P<0.001
Nevus size	1.69 \pm 6.19 (min:0.26-max:26.61)	4.20 \pm 9.13 (min:0.11-max:53.58)	P=0.001

Table 3. Pattern distribution according to age

	Group 7≥	Group 8≤
Pattern structure	n (%)	n (%)
Globular	81(43.8)	245 (18.9)
Globular-reticular	34 (18.4)	125 (31.7)
Reticular	42 (22.7)	209 (31.7)
Homogenous	6(3.2)	16 (2.4)
Globular-homogenous	21 (11.4)	38 (5.8)
Reticular-homogenous	1 (0.5)	27 (4.1)

*P= 0.03 chi-square
p:0.03 (chi-square) between age groups and dermoscopic pattern

globular pattern was observed in children aged 0-16 years, and that they did not detect a pattern difference with increasing age. In the study of Aguilera et al. (11) conducted with 180 children between the ages of 1 and 15, it was found that the most common pattern was the lobular pattern and that adolescents had more nevi with reticular pattern than young children. In the study of Scope et al. (18) conducted with 11-year-old children, they reported that the most common pattern was homogeneous pattern, followed by globular and reticular pattern, respectively. Changchien et al. (19) reported that under 12 years of age, the most common pattern is globular, and under 12 years of age, reticular pattern is observed more frequently, and reticular pattern nevus is more common in the extremities.

In the study of Piazza et al. (20) conducted with children aged 0-16 years, they reported that nevi with globular pattern were frequently located in the trunk, and the reticular pattern nevi in extremities. In the study of Fonseca et al. (21) on adolescents with a mean age of 14 years, they reported that nevi with globular pattern in the trunk located nevi, and the reticular pattern in the extremity nevi were observed more frequently. For nevocogenesis, Unna (1896) developed the Abtropfung hypothesis (melanocytic cell formed in the epidermis and descended into the dermis) and suggested that the nevus cells formed

in the dermal-epidermal region initially started as junctional nevus, then progressed into the dermis and eventually became a compound nevus and finally the dermal nevus (22). On the other hand, unlike Unna's Abtropfung hypothesis, nevi with globular and reticular patterns have biologically different nevus subsets to age and anatomical localization (13,21), the "structural or endogenous" pathway that starts in childhood is proposed to lead to nevi without globular or specific dermoscopic patterns, "acquired or exogenous" pathway is proposed to lead to nevi with reticular pattern and increased ultraviolet exposure due to advancing age is the most likely exogenous cause (23).

It has been suggested that nevi with globular pattern are late-term clinics of congenital nevi and that globular pattern is more frequent in the trunk due to the cephalo-caudal and axio-peripheral migration of melanoblasts (19,24). Considering these hypotheses, the fact that nevi with reticular patterns were observed more frequently in the older age group and extremities in our study may be due to ultraviolet exposure.

In our study, it was observed that the predominate pigment network was uniform in both age groups, but the number of nevi with central pigment changes in the 8 and over age group was observed. In 7 and below age group, the difference in pigment network according to localization was not monitored, whereas

Table 4. Pigment network distribution according to age

	Group 7 ≥	Group 8 ≤
Pigment network structure	n(%)	n(%)
Uniform	175(94.6)	517(78.3)
Central hyperpigmentation	6(3.2)	55(8.3)
Central hypopigmentation	-	21(3.2)
Multifocal	4(2.2)	53(8)
Peripheral hyperpigmentation	-	5(0.8)
Peripheral hypopigmentation	-	9(1.4)

P=0.001 chi-square
p:0.001(chi-square) between age groups and pigment network structure

in the 8 and over age group, it was observed that they had less central hyperpigmentation in the nevi in the trunk localization. The difference in age in the pigment network may indicate the effect of increased ultraviolet exposure to the nevus pigment network. Emiroğlu et al. (25) reported that the most common pigment network was central hyperpigmentation in their study conducted with the subjects with a mean age of 45 years. Zalaudek et al. (26) reported that uniform pigment network was observed the most in the 0-15 age group, and that the number of nevi with central hyperpigmentation increased in the 16-30 age group and this change was attributed to an increased exposure to cumulative ultraviolet.

In conclusion, although acquired melanocytic nevi in the pediatric age group often have a globular pattern and uniform pigment network, the number of nevi with reticular pattern and central pigmentation changes increase with increasing age. The most likely culprit of this increase seems to be increased ultraviolet exposure.

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