Journal of Pigmentary Disorders

Kucuk et al., Pigmentary Disorders 2016, 3:3
DOI: 10.4172/2376-0427.1000243

Research Article OMICS International

Frequency and Dermoscopic Features of Congenital Melanocytic Naevi in Antalya, Turkey and Review of the Literature

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Received date: May 10, 2016; **Accepted date:** September 10, 2016; **Published date:** September 19, 2016

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Abstract

Background: Congenital melanocytic naevi (CMN) are present at birth or they develop during the first year of life. In the literature, there is no study prospectively determining the prevalence and dermoscopic patterns of CMN among 0-12 months old infants. There is no data about its frequency in Turkish population. Dermoscopic diagnostic criteria for CMN are not clear.

Aim: The aim of this study is to determine the frequency of CMN in our region and to define their dermoscopic properties.

Methods: 4289 consecutive infants aged between 0 and 12 months, admitted to pediatric outpatient clinics of Akdeniz University Hospital were included in this study. Infants were first examined by a pediatrician and those with naevi were consulted to a dermatologist. Lesions of CMN were evaluated with camerated dermatoscopy device and images were recorded to a computer.

Results: CMN were detected in 0,5% (n:20) of cases. Lower extremity was the most common location (60%), followed by scalp (15%), trunk (10%), upper extremity (10%) and more than one location (5%). Naevi diameter was 1.5-20 cm in 11 cases, smaller than 1,5cm in seven cases and greater than 20cm in two cases. In dermoscopic examination dot structure (n:18) and globular pattern (n:15) were mostly observed. Other findings included multifocal hypopigmentation pattern (n:6), reticular pattern (n:4), homogeneous pattern (n:4), cobblestone pattern (n:2), and parallel furrow pattern (n:1).

Conclusion: This is the first prospective study to determine the prevalence and dermoscopic patterns of CMN among 0-12 months old infants admitted to a pediatric outpatient clinic. The frequency of CMN in our region is similar with some of the previous studies. Our Dermoscopic results support that CMN appearing in younger ages is more often characterized by a globular pattern and dot structure.

Keywords: Congenital melanocytic nevus; Dermoscopy; Dermoscopic patterns; Infant

Introduction

Congenital melanocytic nevi (CMN) are present at birth or they develop during the first year of life. In current literature frequency is reported as 1-6% [1]. Although CMN can be seen all over the world, clinical and epidemiological features can show regional differences. To date, little is known about the frequency and dermoscopic patterns of congenital nevi in a Turkish population. In Elazığ, the researchers evaluated dermatological findings of 150 babies during the first three days of life. However, the sample size was too small to determine the frequency of CMN [2].

CMN have a risk of developing malignant melanoma [3]. Melanoma in children generally occur extremely rare and the increased risk of melanoma is associated with large and giant CMN [4]. Although most melanomas develop before the age of 10 years, a recent study showed that it can develop later. Therefore, Yun et al. recommend lifelong follow-up of giant CMN due to melanoma risk [5]. Dermoscopy is widely used in the diagnosis and follow-up of CMN [6]. Few studies have investigated the dermoscopic features of CMN [7-10]. There is only one study on nevi onset in the first years of life [10]. In this study, a total of 103, two year-old children with the presence of at least one naevus attending to dermatology clinic were recruited for the study. However, the study had some limitations, as lesions with a diameter of <3 cm were included and those located on mucosal or subungual sites were excluded.

In the literature, there is no study prospectively determining the prevalence and dermoscopic patterns of CMN among 0-12 months old infants. The aim of this study was to determine prevalence, clinical and dermoscopic features of CMN in our region among 0-12 months old infants admitted to a pediatric outpatient clinic.

Methods

For an estimated prevalence of 1% with a 0.80 statistical power, 95% confidence interval, and statistical significance set at $p<0.05$, required sample size was 2000. Between November 2007 and September 2009,

4289 consecutive patients between 0 and 12 months of age, admitted to Akdeniz University Hospital's Well Child Clinic were evaluated in the study. Infants were first examined by a pediatrician and patients with nevi were consulted to dermatology clinic. The families of the patients gave informed consent. The study protocol was approved by the Ethics Committee of Akdeniz University, School of Medicine (Project No: 2007.04.0103.004). Genders and ages of cases, location, size and color of nevi and history of getting phototherapy were recorded. Skin types of the patients were determined according to Fitzpatrick skin phototype classification system [11].

Lesions of CMN were evaluated with a camerated dermatoscopy device (Heine Delta 20, Optotechnik GmbH & co. KG, Herrsching, Germany with Canon Powershot A540) by EK and AAK together. The dermatoscope was attached to the camera by Heine-Fotoadapter. The contact plate of the dermoscope was moistened with immersion fluid before photography. Photographic data on the memory card were transferred to patient's folders on the computer. Dermoscopic structures were evaluated according to Braun et al. [12] article reviewing the principles of dermoscopy.

Statistical Analysis

Descriptive analysis of the sample was performed, including percentages for categorical variables and the median age and standard deviation.

Results

CMN was detected in 20 infants admitted to Akdeniz University's Well Child Clinic. Nine of the patients were female and 11 were male, showing a slight male predominance (male to female ratio 1.22). Median age ± standard deviation was 196 ± 215 days. Lesions were light brown in 15 and dark brown in five nevi.

The shortest diameter was 0.3 cm and the longest diameter was above 20 cm. One case had a history of receiving phototherapy. Six cases (30%) had type 1 and 14 (70%) had type 2 skin-type characteristics. Patients' age, gender, skin types, localization and clinical features of the lesions are shown in Table 1.

Lower extremity was the most common location (12 cases, 60%), followed by scalp (3, 15%), trunk (2, 10%), upper extremity (2, 10%), and more than one location (1, 5%). Eleven cases (55%) had medium size (1.5-20 cm), seven (53%) had small size (smaller than 1.5 cm) and two (10%) had giant size (greater than 20 cm) nevi.

In dermoscopic examination dot structure (n:18) and globular pattern (n:15) were mostly observed. Other findings included multifocal hypopigmentation pattern (n:6), reticular pattern (n:4), homogeneous pattern (n:4), cobblestone pattern (n:2), and parallel furrow pattern (n:1). In the patient 3 who had parallel furrow pattern, the lesions were located on the palmar/plantar surfaces of the hands and feet. On the other hand, patients with multifocal hypopigmentation pattern had lesions on the areas with dense hair follicules. In some of the cases there were more than one dermoscopic properties. Dermoscopic features are given in Table 1 and commonly observed dermoscopic patterns are presented in one multipart figure. The patients did not have any melanoma during a follow-up period of 5 years.

Case	Age (day)	Sex	Skin type	Localization	Size (cm)	Lesion	Color	Dermoscopic features
1	15	F	2	Flexor surface of left leg	0.5	Macule	Dark brown	Globular Dot structure
2	180	F	1	Right gluteal region	7	Plaque	Dark brown	Globular Dot structure Reticular
3	135	M	2	Back, anterior trunk, scalp, extremities, palms and soles.	>20	Plaque	Dark brown	Globular Cobblestone Dot structure Parallel furrow
4	360	F	2	Left thigh	0.3	Macule	Brown	Dot structure Reticular
5	17	M	2	Right inguinal region	0.3	Macule	Brown	Globular Dot structure
6	360	M	2	Flexor surface of left arm	2.5	Macule	Brown	Globular Dot structure
7	360	M	1	Lateral site of left thigh	1.5	Macule	Brown	Globular Dot structure Multifocal hypopigmentation
8	135	F	1	Medial site of left leg	0.8	Macule	Brown	Globular

								Reticular
9	20	F	2	Right gluteal region	7	Plaque	Brown	Globular Dot structure Multifocal hypopigmentation
10	13	M	2	Medial site of right leg	1.5	Macule	Brown	Globular Dot structure Cobblestone
11	360	F	2	Left parietal site of scalp	12	Plaque	Dark brown	Multifocal hypopigmentation Homogenous
12	240	F	2	Right frontal region of scalp	0.5	Macule	Dark brown	Globular Dot structure Multifocal hypopigmentation
13	180	F	2	Medial site of left leg	2.5	Plaque	Brown	Globular Dot structure Reticular
14	3	M	2	Frontal region of scalpl	1.5	Plaque	Brown	Globular Dot structure Homogenous
15	75	M	1	Left upper extremity	1.5	Plaque	Brown	Dot structure Homogenous
16	13	M	2	Fronts of thrunk	0.5	Macule	Brown	Globular Dot structure
17	240	M	2	Scrotum	0.4	Macule	Brown	Dot structure Multifocal hypopigmentation
18	330	F	1	Right thigh	1.5	Plaque	Brown	Globular Dot structure Multifocal hypopigmentation
19	150	M	1	Left scapular region of back	1.5	Plaque	Brown	Dot structure Homogenous
20	21	M	2	Flexor site of left leg	3	Plaque	Brown	Globular Dot structure

Table 1: Patient characteristics and clinical and dermoscopic features of the lesions.

Discussion

CMN was detected in 0.5% of cases. There is only a few studies about the prevalence of CMN in child population. We were unable to find any study that provides prevalence and dermoscopic patterns of CMN among 0-1 year old children. Therefore, we compared our findings with studies investigating prevalence in newborns. In Turkey, there is only one report about frequency of CMN [2]. In Elazığ, a city located in Eastern Anatolia, Ozturk et al. evaluated dermatological findings of 150 babies in the first three days and found one CMN (0.6%) among these newborns. However, sample size was very limited for determining the frequency of CMN and dermoscopic findings, and size or location of the lesion were not specified. Studies including the frequency of CMN in newborns are summarized in Table 2. In some European countries [13-23], studies reported prevalence rates ranging from 0.2% to 6%. These large differences can be due to the clinical heterogeneity of the studies, in terms of methods and geographical and genetic variations. The lowest incidence of the disease has been reported from the Sweden as 0.2% [15]. In this study, the data was obtained from a revised International Classification of Diseases (ICD) database. The data entry had been made for the patient when the lesion was biopsied. Thus, the data may not be good enough for the true frequency in the population. Interestingly, in the study of Lorenz et al. [18] from Germany, the incidence was notably high (6%) when compared to the other European countries. Increased frequency of CMN in Germany shows that the genetic and geographic factors may play an important role for the development of the disease.

Our report is similar with some of the previous studies. As seen in Table 2, there are regional differences in the Mediterranean coast. Our

city, which has a sunny and humid climate, is a major immigration area especially in summer for seasonal laborers from the Eastern part of Turkey. The regional factors can depend on the genetic background of the populations. A recent study by Kinsler et al. [24] also supports the genetical background in the phenotype of the CMN. They noted that there were significantly fewer blonde/light brown–haired individuals in the CMN cohort than in control groups and they identified associations between families with CMN-affected children and the red hair pigmentary phenotype, and associations between melanocortin-1-receptor gene variants and the presence and extent of CMN. In our study, all children had a fair pigmentary type. It is hard to make definitive comparisons with the skin types of the general population of Turkish people because of the lack of previous publication on skin type [25-27]. Moreover, the Fitzpatrick skin phototype is determined by constitutional colour and the result of exposure to ultraviolet radiation and it is hard to describe the phototype in children aged 0-12 months in the aspect of lack of tanning and exposition to sunburns. However, Tiftikcioglu et al. [25] remarked most of the population of their clinic had type 2 and 3 skins ranging from Fitzpatrick type 1 to 5. Akyol et al. [26] showed that common melanoctic nevus in children was more frequent in children having a lighter skin type, and their numbers increase with age.

In terms of lesion size, studies in newborns showed that small CMN was the most common type (Table 2). In our study, medium CMN was more common. This discrepancy with the others may be due to the enrollment of a different age group (0-12 months olds) in our study. These studies also reported that the trunk was the most common anatomical location in newborns. Stinco et al.'s [10] studies show that CMN can be located on the lower extremities in the first years of life. These findings suggest that the most common localization areas of CMN may change over time with age and with the continuation of development of the nevi and the individual.

Studies (Reference #)	Country, year	Case Number	Sex	Frequency	Localization	Diameter
Zina et al. [13]	Italy, 1985	3,072	NR	1%	NR	NR
Kroon et al. [14]	Denmark, 1987	314	50 female, 50 male	0.6%	100% extremities	50% small, 50% medium
Goss et al. [15]	England, 1990	1012	67 female, 33 male	0.6%	33% head, 67% trunk	83% small, 17% medium
Prigent et al. [16]	France, 1991	299	NR	3.3%	NR	NR
Karvonen et al. [17]	Finland, 1992	4346	50 female, 50 male	1.5%	14% head, 46% trunk, 38% extremities	60% <1 cm, 20% 1-1.9 cm, 19% 2-19.9 cm, 2% giant
Navas et al. [18]	Spain, 1995	1027	NR	1.6%	NR	NR
Lorenz et al. [19]	Germany, 2000	1000	NR	6%	18% head, 44% trunk, 35% extremities	82% ≤ 1 cm, 14% >1 cm
Berg [20]	Sweden, 2003	2198619	NR	0.2%	NR	NR
Ozturk et al. [2]	Turkey, 2004	150	100 female	0.6%	NR	NR
Boccardi et al. [21]	Italy, 2007	620	NR	3.2%	10% head, 70% trunk, 20% extremities	90% small, 10% medium
Paláu-Lázaro et al. [22]	Spain, 2008	1000	50 female, 50 male	1.4%	7% head, 21% trunk, 71% extremities	86% small, 14% medium
Monteagudo et al. [23]	Spain, 2011	1000	71 female, 29 male	1.4%	14% head, 57% trunk, 29% extremities	50% <1.5 cm, 50% 1.5-3.5 cm

Table 2: Studies including the frequency of congenital melanocytic naevi in newborns, NR: Not reported.

Several studies investigated the dermoscopic features of CMN in child population [6-9,28-31]. Studies including the dermoscopic features are summarized in Table 3.

Studies	Country, year	Age, year	Case Number	Participants from	Dermoscopic patterns, %
Oliveria et al. [7]	Massachusetts-USA, 2004	12	52	Students from the Framingham School in Massachusetts	Globular, 38 Reticular, 14 Structureless, 38 Combinations, 10
Zalaudek et al. [8]	Graz-Austria, 2006	10-75	1268*	Individuals with at least 10 melanocytic naevi from Pigmented Skin Lesion Clinic in Graz	Globular, 24

					Reticular, 5 Homogeneous, 5 Globular-Homogeneous, 36 Reticular-Globular, 21 Reticular-Homogeneous, 7
Aguleria et al. [9]	Barcelona, Spain, 2009	1-15	180	The Dermatology Department at Hospital Clinic and the Pediatric Dermatology Department at Hospital Sant Joan de Deu in Barcelona	Globular, 53 Reticular, 16 Homogeneous, 9 Globular-Homogeneous, 11 Reticular-Globular, 3 Reticular-Homogeneous, 2
Stinco et al. [10]	Udine-Italy, 2011	1-2	103	Individuals with lesion' diameter of < 3 cm the Department of Dermatology at San Michele Hospital in Gemona del Friuli, Udine	Globular, 84 Reticular, 40 Dot structure, 39 Focal hypopigmentation, 10 Perifollicular Hypopigmentation, 3 Blotches, 2 Veil, 2 Streaks, 1
Scope et al. [31]	Massachusetts- USA, 2011	11	366	Students from the Framingham School in Massachusetts	Homogeneous, 72 Combinations, 70 Globular, 67 Reticular, 62
Current study	Antalya-Turkey,	0-1	20†	Pediatrics outpatient clinic at Akdeniz University Hospital	Dot structure, 90 Globular, 75 Multifocal hypopigmentation, 30 Homogeneous, 20 Reticular, 20 Cobblestone, 10 Paralel furrow, 5

Table 3: Studies including the dermoscopic features of congenital melanocytic naevi, *Patients number 10 in the case with 1-15 years old, †Cases between consecuitive 4289 cases aged between 0 and 1 years.

In these studies, patients attending dermatology or pediatric dermatology clinics were recruited and age groups differed from birth to 15 years of age. Oliveria et al. [7] and Zalaudek et al. [8] found a marked predominance of globular pattern (82%) among children between 0-15 years of age and at 12 years of age, respectively. Stinco et al. [10] showed that the predominant dermoscopic patterns were globular (CMN present at birth 51%; naevi appearing after birth during the first 2 years of life 58%) and reticular (CMN present at birth 28%; naevi appearing after birth during the first 2 years of life 14%). Lesions with a diameter of >3 cm or that were located on mucosal or subungual sites were excluded from their study.

Anguilera et al. [9] investigated the number and dermoscopic patterns of melanocytic nevi among individuals of 1–15 years of age. They found that 81.1% had nevi with a globular pattern and 52.8% with a reticular pattern. They reported the rate of each pattern was increasing with age. Regarding the pattern predominance, they observed that homogeneous pattern which is more common in younger ages was decreasing with age, while reticular pattern was more predominant in older ages and the frequency of a predominant globular pattern was constant among all ages. According to this, age might be a factor for having a dominant reticular pattern, but not for having a dominant globular pattern.

Mangononi et al. [32], in their study, investigated the dermoscopic, histological and immunohistochemical cancerous features in acquired melanocytic nevi that have been repeatedly exposed to UVA or UVB. They reported that nevi exposed to NB-UVB or UVA1 showed statistically significant increase in size and changes in their dermoscopic features, including overall darkening, increased reticular pattern and increased number and size of brown globules and dots. Unfortunately, the size of the dataset of our study, with only 20 CMN, is inadequate to perform a statistical analysis on dermoscopic patterns or distribution to specific body sites.

CMN can develop to other patterns in the course of naevus evolution [10,33,34]. Specific dermoscopic patterns can be observed in some anatomic localizations depending on skin histology

[28-30,35-37]. In our study, we observed parallel furrow pattern in palmar surfaces of hands and feet, and multifocal hypopigmentation pattern in areas with high concentration of hair follicles due to perifollicular hypopigmentation.

Our study is the first study to show clinical features and dermoscopic patterns of CMN in children from our population. In addition, the design of the study prospectively determine the prevalence and dermoscopic patterns of CMN among 0-12 months old infants admitted to a pediatric outpatient clinic and makes this study different from previous reports in the literature.

Acknowledgement

The study was supported by Akdeniz University Scientific Research Projects Unit.

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