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Prevalence and Clinical Features of Congenital Melanocytic Nevi in 1,000 Spanish Newborns

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KEYWORDS

Birthmark;
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Abstract

Background: Congenital melanocytic nevus is a benign proliferation of melanocytes that is present at birth or develops in the first months of life. Although such lesions are common, few studies have analyzed their prevalence in Spain.

Objectives: The aim of this study was to define the prevalence and most frequent anatomical areas affected by congenital melanocytic nevi in our health service area. We also analyzed the influence of maternal and neonatal factors in the development of these lesions.

Patients and methods: We performed a prospective study of 1000 consecutive neonates seen in the first 72 hours of life in the perinatology clinic of the Pediatrics Department of Hospital Arquitecto Marcide in Ferrol, Spain, recording specific maternal and neonatal variables and the size and site of congenital melanocytic nevi if present.

Results: Fourteen infants (10 girls and 4 boys; 12 white European, 2 North African; 1.4% of the study population) presented at least 1 melanocytic nevus. None had more than 1 lesion. Eight of the nevi were located on the trunk, 2 on the face, 2 on the upper limbs, and 2 on the lower limbs. The diameter of the lesions was less than 1.5 cm in half of cases and between 1.5 and 3.5 cm in the remainder.

Conclusions: There was a higher prevalence of congenital melanocytic nevi in preterm infants, females, and nonwhite infants. Maternal age, number of previous pregnancies, and birth weight do not appear to influence the prevalence of these lesions.

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PALABRAS CLAVE

Marca de nacimiento;
Nevo melanocítico
congénito;
Lesión pigmentada;
Recién nacido

Prevalencia y características clínicas de los nevos melanocíticos congénitos en 1.000 recién nacidos españoles

Resumen

Introducción: El nevo melanocítico congénito es una proliferación melanocítica benigna presente al nacimiento o en los primeros meses de vida. Aunque es una lesión común, hay pocos estudios en nuestro entorno que analicen su frecuencia. El objetivo de nuestro estudio es conocer su prevalencia y las localizaciones más frecuentes en los recién nacidos de nuestra área sanitaria, y analizar la influencia de los factores neonatales y maternos en el desarrollo de estas lesiones.

Pacientes y métodos: Realizamos un estudio prospectivo de 1.000 neonatos consecutivos vistos en las primeras 72 horas de vida en la consulta de Perinatología del Servicio de Pediatría de nuestro hospital (Hospital Arquitecto Marcide, Ferrol, España). En cada caso se recogieron datos referentes a diferentes parámetros maternos y neonatales, y la presencia, el tamaño y la localización de los nevos melanocíticos congénitos.

Resultados: Catorce neonatos (el 1,4% de los neonatos incluidos) presentaban al menos un nevo melanocítico congénito. Doce eran caucásicos y 2 árabes. Respecto al sexo, 10 recién nacidos eran de sexo femenino y 4 de sexo masculino. En todos los casos presentaba solo un nevo melanocítico. Ocho se localizaban en el tronco, 2 en el área facial, 2 en las extremidades superiores y 2 en las inferiores. El 50% de los nevos melanocíticos congénitos tenían un diámetro inferior a 1,5 cm y la otra mitad entre 1,5 y 3,5 cm.

Conclusiones: Existe una mayor prevalencia de nevos melanocíticos en los recién nacidos pretérmino, de sexo femenino y no caucásicos. La edad materna, el número de gestaciones previas y el peso al nacimiento no parecen influir en su aparición.

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Introduction

Congenital melanocytic nevus (CMN) is a benign proliferation of melanocytes that is present at birth or develops in the first few months of life. Except in early infancy, when CMN can grow rapidly, the lesions increase in size in proportion with the child's growth.^{1,2} Depending on their size in adults, lesions are classified as small (maximum diameter <1.5 cm), medium (1.5-19.9 cm), and large or giant (≥ 20 cm). In a newborn, a diameter of 9 cm on the head or 6 cm on the body is considered giant. The relevance of these lesions lies in their cosmetic and psychological implications, the risk of malignant transformation—especially in large lesions—and in the possibility that they could develop in association with syndromes such as neurocutaneous melanocytosis and spinal dysraphism.³⁻⁶

Clinically, CMNs tend to be homogeneous light brown macular round or oval lesions with well-defined borders. They vary in color with age and may become darker and develop terminal hair. Diagnosis is not always easy in neonates: the lesions may be confused with other pigmented lesions, such as café-au-lait spots, smooth muscle hamartoma, Mongolian spots, plexiform neurofibroma, and mastocytoma.^{4,7,8}

Although CMN is a very common tumor, few studies have analyzed its frequency in our setting.^{9,10} Our objectives were to determine the prevalence and location of these lesions in newborns in our health care area and to evaluate their association with neonatal and maternal factors.

Patients and Methods

We performed a prospective study of 1000 consecutive live newborns seen in the perinatology clinic of the Department of Pediatrics at Hospital Arquitecto Marcide, in Ferrol, Spain. All neonates born in a hospital belonging to the Ferrol health care district are examined at this clinic during the first 72 hours of life. The district comprises 205 121 inhabitants distributed among 20 local councils.

The data collection protocol used in each case covered the following: *a)* neonatal parameters, namely, gestational age, sex, race (ethnicity or geographic origin of the parents), and birth weight, as well as presence, size, and location of CMN; and *b)* maternal factors, namely, age and number of previous pregnancies.

A dermatologist and a pediatrician examined the newborn jointly. The examination was performed under appropriate lighting with the patient naked (no diaper) and covered the complete surface of the skin, including the scalp, nails, and oral mucosa. Diagnosis was based on clinical findings. We did not schedule a second visit to follow the progress of the lesions or to diagnose subsequent lesions (tardive CMN).

Data for the quantitative variables were categorized into groups. Qualitative variables were expressed as a percentage and analyzed using the χ^2 test. The statistical analysis was performed using SPSS version 15.0. Statistical significance was set at a *P* value of <.05.

Table 1 Location and Size of Congenital Melanocytic Nevi

| No. | Ethnic Group | Sex | Site | Dimensions, cm |
|-----|---------------|--------|-------------------------------|----------------|
| 1 | White | Female | Left eyebrow | 0.2×0.2 |
| 2 | White | Female | Left eyebrow | 0.5×0.3 |
| 3 | White | Male | Right scapula | 2×2 |
| 4 | White | Female | Middle of the back | 3.5×1.5 |
| 5 | White | Female | Middle of the back | 2.5×0.5 |
| 6 | White | Female | Right flank | 2.5×2 |
| 7 | White | Male | Abdomen | 2.5×0.5 |
| 8 | White | Male | Lumbosacral region | 3.5×1.5 |
| 9 | White | Female | Pubis | 0.3×0.3 |
| 10 | White | Female | Left labia majora | 2×1 |
| 11 | White | Female | Right forearm | 1×1 |
| 12 | North African | Female | First finger of the left hand | 0.4×0.2 |
| 13 | North African | Male | Left knee | 0.3×0.3 |
| 14 | White | Female | Left ankle | 0.4×0.4 |

Results

The 1000 newborns were recruited over a 19-month period (May 2008 to November 2009). Fourteen newborns (1.4%) had CMN, and in all those cases it was the only lesion identified.

Table 1 shows the sex and ethnic group of the newborns, as well as the location and size of the lesions. The series included 10 girls and 4 boys; 12 patients were white European and 2 were North African. Eight cases had lesions within the trunk, sacral region, and genital area. Two lesions were found on the face, 2 on the upper extremities, and 2 on the lower extremities. The diameter of the lesion was <1.5 cm in 50% of cases and 1.5-3.5 cm in the other 50% (Figure 1).

Table 2 shows the frequency of CMN according to neonatal and maternal parameters. Prevalence varied little with birth weight, maternal age, or number of previous pregnancies. Lesions were more common in girls

(2.1%), nonwhites (2.6%), and preterm infants (4%). The differences were not statistically significant for any of the parameters.

Discussion

Our study corroborates some of the findings of other European series (Table 3).⁹⁻¹⁷ Depending on the population studied, the prevalence of CMN varies between the 0.2% reported by Berg et al¹⁶ and the 6% reported by Lorenz et al.¹⁵ Comparison between series is problematic, as diagnosis is based on clinical findings in some studies¹² and on histopathology findings in others.¹¹ Our frequency of 1.4% is somewhat lower than that reported by Boccardi et al¹⁷ in Italy (3.2%) and Prigent et al¹³ in France (3.3%), and similar to that of Navas et al⁹ and Palau-Lázaro et al¹⁰ in other areas of Spain (1.6% in Seville and 1.4% in Granada, respectively). These variations could be due to

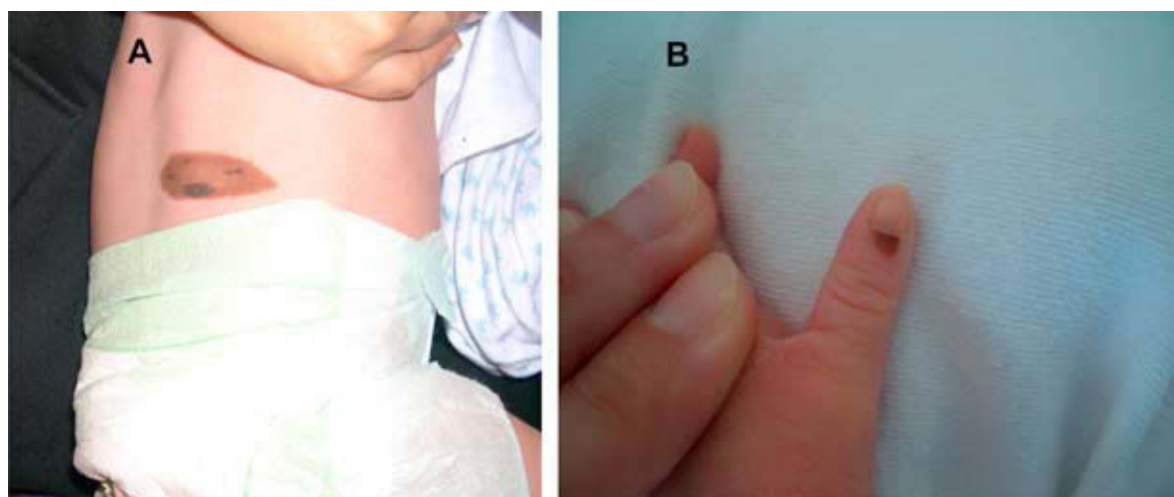


Figure 1 A, Case 8, congenital melanocytic nevus in the lumbosacral region. B, Case 12, lesion in the periungual region.

Table 2 Frequency of Appearance of Congenital Melanocytic Nevus According to Neonatal and Maternal Parameters

| Group | Cases | Sex | | Ethnic Group | | Gestational Age, mo | | | Birth Weight ^a | | Age of Mother, y | | | No. of Previous Pregnancies | | | |
|----------------|-------|-------|--------|--------------|----------|---------------------|-------|-----|---------------------------|--------|------------------|-------|-------|-----------------------------|-------|-----|-----|
| | | Male | Female | White | Nonwhite | <37 | 37-41 | ≥42 | Low | Normal | High | ≤29 | 30-34 | ≥35 | 0 | 1 | ≥2 |
| CMN | 14 | 4 | 10 | 12 | 2 | 3 | 11 | 0 | 1 | 12 | 1 | 5 | 6 | 3 | 7 | 4 | 3 |
| Non-CMN | 986 | 524 | 462 | 910 | 76 | 72 | 901 | 13 | 68 | 857 | 61 | 402 | 347 | 237 | 491 | 324 | 171 |
| Total | 1000 | 528 | 472 | 922 | 78 | 75 | 912 | 13 | 69 | 869 | 62 | 407 | 353 | 240 | 498 | 328 | 174 |
| F, % | 1.4 | 0.8 | 2.1 | 1.3 | 2.6 | 4 | 1.2 | 0 | 1.4 | 1.4 | 1.6 | 1.2 | 1.7 | 1.3 | 1.4 | 1.2 | 1.7 |
| χ ² | | 3.344 | | 0.831 | | | 4.106 | | 0.024 | | | 0.356 | | | 0.210 | | |
| P | | .067 | | .362 | | | .128 | | .988 | | | .837 | | | .900 | | |

Abbreviation: CMN, congenital melanocytic nevus.

^aLow, <2500 g; normal, 2501-3999 g; high, ≥4000 g.

the length of follow-up (inclusion of tardive CMN), the specialty of the clinician performing the evaluation, or the way in which the diagnosis was made (clinical findings or histopathology).^{18,19} Walton et al⁸ and Kroon et al¹¹ consider that it is often impossible to differentiate clinically between a CMN and other pigmented lesions in a newborn. Examination by a nondermatologist could overestimate the prevalence of CMN, by the inclusion of other types of pigmented lesions. Frequency decreases when diagnosis is based on histopathology alone: in the series by Walton et al⁸ prevalence fell from 3.9% based on a clinical diagnosis to 1% based on a histopathological diagnosis, and in that of Kroon et al,¹¹ it fell from 1% to 0.6%. Goss et al¹² maintain that the frequency of CMN observed in some series is lower because the studies were designed to consider all congenital anomalies and not specifically cutaneous lesions,²⁰ as seen, for example, in the frequency of 0.2% reported by Berg et al.¹⁶ The fact that 83.5% of newborns in our series were examined within 24 hours of delivery could be another important factor. Benign transitory lesions, such as vernix caseosa, benign transient hypertrichosis, and generalized rubor (physiological vasomotor instability), make it difficult to differentiate between pigmented lesions and, therefore, reduce the observed prevalence of CMN.

The frequency of CMN is usually similar in both sexes,^{10,11,14} or, as was the case in our study and in that of Goss et al,¹² the lesions are more common in girls.¹¹ As recently reported by Aguilera et al,¹⁸ it is curious that a higher frequency of melanocytic nevi (congenital and acquired) is repeatedly observed depending on ethnic background. The lesion is less common in whites than in ethnic groups with darker skin coloring, in whom the frequency—as was the case in our study—at least doubles (1.3% to 2.6%). Thus, Prigent et al¹³ found that the prevalence of CMN in newborns of European origin was 2.3% compared with 11.1% in those born outside Europe; Lorenz et al¹⁵ reported similar findings (5.3% vs 12.5%), as did Boccardi et al¹⁷ (2.2% vs 7%). These results should be interpreted with caution, as one of the limitations of European studies is the small sample size for nonwhite newborns; however, the predominance remained unchanged in US series²¹⁻²³ and an Australian series.²⁴

Seven of the 10 European studies reported the size and location of the CMN,^{10-12,14-17} as did we. Based on the table of Lund and Browder²⁵ for children aged less than 1 year, the head and neck account for 21% of body area, the trunk (including the buttocks and genital area) 32%, and the extremities 47%. Therefore, we might expect most lesions to be found on the extremities. However, as in our study, 4 of the series reported the most common anatomical location to be the trunk.^{12,14,15,17} Only Kroon et al¹¹ and Paláu-Lázaro¹⁰ found the extremities to be the most common site of the lesions. In both our study and that of Kroon et al, only half of the CMNs were <1.5 cm in diameter. This finding is lower than that of the other 5 series, in 4 of which small CMNs accounted for 80% of the lesions.^{10,12,15,17} In our series, small CMNs may have gone undetected due to the difficulty of examining the newborn during the first 24 hours of life (see above). We did not observe giant CMN, which appear in fewer than 0.005% of newborns²⁶; only Karvonen et al¹⁴ observed 1 case. Although Castilla et al²⁰ observed a

Table 3 Prevalence, Location, and Diameter of Congenital Melanocytic Nevi in Different European Studies

| Reference | Country | No. of Newborns | Ethnic Origin of Newborn or Geographic Origin of Parents | Frequency of CMN | Sex | Location | Diameter |
|----------------------------------------------------------|------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Kroon et al ¹¹ | Denmark | 314 | 97.1% Scandinavian 2.9% other | 0.6% | 50% male 50% female | 0% head 0% trunk 100% extremities | 50% small 50% medium ^a 0% giant ^b |
| Goss et al ¹² | England | 1012 | 100% white | 0.6% | 33.3% male 66.7% female | 50% UE and 50% LE 33.3% head 66.7% trunk 0% extremities | 83.3% small 16.7% medium ^a 0% giant ^b |
| Prigent et al ¹³ | France | 299 | 88% Europe 5% North African 2.3% Black Africa 1.7% India and Sri Lanka 1.7% Eurasia 1.3% Antilles 100% white | 3.3% (2.3% European and 11.1% non-European) | NR | NR | NR |
| Karvonen et al ¹⁴ | Finland | 4346 | 100% white | 1.5% | 50% male 50% female | 14% head 46% trunk 38% extremities (7% UE and 31% LE) | 60% <1 cm 20% 1-1.9 cm 18.5% 2-19.9 cm 1.5% giant ^b |
| Navas et al ⁹ Lorenz et al ¹⁵ | Spain Germany | 1027 1000 | NR 90.4% white 6.4% Balkan 0.9% Asian 0.5% African 1.8% mixed | 1.6% 6% (5.3% white and 12.5% nonwhite) | NR NR | NR 18% head 44% trunk | NR 81.7% ≤1 cm 13.6% >1 cm |
| Berg et al ¹⁶ Boccardi et al ¹⁷ | Sweden Italy | 2198 619 | 79.2% Europe 6.1% Asia 5.8% North Africa 3.7% South America 4.5% other 100% white | 0.2% 3.2% (2.2% European and 7% non-European) | NR NR | NR 10% head 70% trunk | NR 90% small 10% medium ^a |
| Paláu-Lázaro et al ¹⁰ | Spain | 1000 | 100% white | 1.4% | 50% male 50% female | 20% extremities 7.1% head 21.4% trunk 71.4% extremities | 0% giant ^b 85.7% small 14.3% medium ^a 0% giant ^b |

Table 3 (Continuation)

| Reference | Country | No. of Newborns | Ethnic Origin of Newborn or Geographic Origin of Parents | Frequency of CMN | Sex | Location | Diameter |
|-------------------------------|---------|-----------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------|
| Monteagudo et al ^c | Spain | 1000 | 92.2% white 2.9% Roma 2.3% Latin American 0.7% black 0.75 North African 0.7% Asian 0.5% mulatto | 1.4% (1.3% white and 2.6% nonwhite) | 28.6% medium ^a 71.4% medium ^a | 28.6% head 57.1% trunk 28.6% E (14.3% UE and 14.3% LE) | 50% small 50% medium ^a 0% giant |

Abbreviations: CMN, congenital melanocytic nevus; LE, lower extremities; NR, not reported; T, trunk (includes sacral region, buttocks, and genital area); UE, upper extremities.

^a1.5-19.9 cm in diameter.

^b≥20 cm in diameter.

^cPresent study.

greater frequency of CMN in newborns with malformations (1 compared with 0.2%), none of the newborns in our study presented associated developmental abnormalities.

Recent studies show that ethnic origin and sex are not the only parameters that affect the prevalence of many cutaneous lesions that are present at birth, such as Mongolian spots, hemangioma, and erythema toxicum neonatorum.^{4,17,27} In contrast with the results of Goss et al,¹² we found an association with gestational age, namely, CMNs were more common among preterm infants. Factors such as birth weight, maternal age, and number of previous pregnancies did not seem to affect the appearance of CMN, although the limited number of cases evaluated could have made it impossible to detect such an uncommon association.

In conclusion, we found a frequency of CMN of 1.4% in the 1000 newborns we studied. All cases involved single lesions measuring <3.6 cm in diameter, and most lesions were found on the trunk. We observed a higher prevalence in preterm newborns, girls, and nonwhite patients. Maternal age, number of previous pregnancies, and birth weight do not seem to affect the frequency of CMN.

Conflict of Interest

The authors declare that they have no conflict of interest.

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