



ACTAS Dermo-Sifiliográficas

Full English text available at
www.elsevier.es/ad



ORIGINAL ARTICLE

Prevalence of Birthmarks and Transient Skin Lesions in 1000 Spanish Newborns

B. Monteagudo,^{a,*} J. Labandeira,^b E. León-Muiños,^c I. Carballeira,^c A. Corrales,^c
M. Cabanillas,^a O. Suárez-Amor,^a J. Toribio^b

^aServicio de Dermatología, Hospital Arquitecto Marcide, Área Sanitaria de Ferrol, SERGAS, Ferrol, La Coruña, Spain

^bServicio de Dermatología, Complejo Hospitalario Universitario de Santiago de Compostela (CHUS), SERGAS, Facultad de Medicina, Santiago de Compostela, La Coruña, Spain

^cServicio de Pediatría, Hospital Arquitecto Marcide, Área Sanitaria de Ferrol, SERGAS, Ferrol, La Coruña, Spain

Manuscript received June 11, 2010; accepted for publication August 1, 2010

KEYWORDS

Transient skin lesion;
Birthmark;
Neonates;
Prevalence;
Newborns

Abstract

Background and objectives: Almost all newborn children have some sort of birthmark or transient benign skin lesion. Few studies, however, have analyzed their frequency, particularly in Spain. The aims of this study were to determine their prevalence in 1000 newborn children in the health care area of Ferrol in northwest Spain and to compare the results with those of 9 other studies with similar characteristics.

Patients and methods: We undertook a descriptive study of 1000 newborn infants seen in the first 3 days of life at the neonatal clinic in the Department of Pediatrics, Hospital Arquitecto Marcide, Ferrol, Spain. Each infant was examined for the presence of 19 different transient benign skin lesions and 11 birthmarks.

Results: Birthmarks or benign skin lesions were present in 994 neonates (99.4%). Transient skin lesions were present in 99.2% and birthmarks in 72%. The 5 most prevalent lesions were sebaceous hyperplasia (75%), salmon patch (64.2%), hypertrichosis (59%), sucking calluses (54%), and palatine cysts (53.7%).

Conclusions: The results of this study show that most neonates have benign skin lesions. The findings of studies to assess their frequency are influenced not only by geographic location (affecting variables such as climate, social and health care conditions, and ethnic group) but also by the timing of examination, the inclusion criteria applied, and the terminology used.

© 2010 Elsevier España, S.L. and AEDV. All rights reserved.

*Corresponding author.

E-mail address: benims@hotmail.com (B. Monteagudo).

PALABRAS CLAVE

Lesión cutánea transitoria;
 Marca de nacimiento;
 Neonato;
 Prevalencia;
 Recién nacido

Prevalencia de marcas de nacimiento y lesiones cutáneas transitorias en 1.000 recién nacidos españoles

Resumen

Introducción: Prácticamente la totalidad de los neonatos presenta alguna marca de nacimiento o lesión cutánea benigna transitoria. Hay pocos estudios, especialmente en nuestro país, que analicen la frecuencia de estos trastornos. Nuestro objetivo es conocer su prevalencia en 1.000 recién nacidos del área sanitaria de Ferrol y compararla con los hallazgos de otras 9 series de similares características.

Pacientes y métodos: Realizamos un estudio descriptivo de 1.000 recién nacidos vistos en los 3 primeros días de vida en la consulta de Perinatología del Servicio de Pediatría del Hospital Arquitecto Marcide. En cada caso se investigó la presencia o ausencia de 19 lesiones cutáneas benignas transitorias y 11 marcas de nacimiento.

Resultados: 994 neonatos, el 99,4%, presentaban alguna lesión cutánea. El 99,2% y el 72% tenían lesiones cutáneas transitorias y marcas de nacimiento respectivamente. Las 5 más prevalentes fueron la hiperplasia sebácea en el 75% de los neonatos, la mancha salmón en el 64,2%, la hipertrichosis en el 59%, el callo de succión labial en el 54% y el quiste palatino en el 53,7%.

Conclusiones: En el presente estudio se demuestra la presencia de lesiones cutáneas benignas en la mayor parte de los neonatos. En su desarrollo y detección influyen no solo las características propias del país donde se realiza el estudio (climáticas, sociosanitarias o "grupos raciales"), sino también variaciones en el periodo de exploración, en los criterios de inclusión de neonatos y en la terminología empleada.

© 2010 Elsevier España, S.L. y AEDV. Todos los derechos reservados.

Introduction

The skin of newborn infants plays a fundamental role in the transition from an aqueous intrauterine environment to the outside world, where it is required to provide mechanical and immunological protection, control thermoregulation, and function as a barrier to prevent insensible fluid loss. Almost all neonates display some form of transient skin lesion or birthmark.¹

Many neonatal skin diseases are thought to be physiological due to their benign, self-limiting nature, and they are rarely examined by dermatologists.² It is nevertheless important to recognize them in order to avoid incorrect diagnosis and unnecessary tests or treatments that generate additional anxiety for parents.³

Few studies have analyzed the frequency of benign skin lesions and birthmarks in newborn infants in Spain. The only study reported to date is that of Navas et al⁵ carried out in Seville. In addition, it is impossible to extrapolate results obtained in one region to the situation in another.⁹ The aim of this study was therefore to determine the prevalence of benign skin lesions and birthmarks in 1000 newborn infants from the health care area of Ferrol, in La Coruña, Spain, and to compare the results with those of 9 similar studies.²⁻¹⁰

Patients and Methods

We undertook a descriptive study of 1000 live newborn infants seen in the neonatology clinic of the Department of Pediatrics at Hospital Arquitecto Marcide in Ferrol, Spain.

All neonates from our health care area born in the hospital are seen in the clinic within the first 3 days of life.

Physical examination was performed jointly by a dermatologist and a pediatrician. The presence or absence of 30 different skin diseases was assessed in each case: 19 transient skin lesions (marked acrocyanosis, sucking pad, sucking pad on the lip, cutis marmorata, perianal dermatitis, physiological desquamation, erythema toxicum neonatorum, genital hyperpigmentation, sebaceous hyperplasia, hypertrichosis, jaundice, miliaria, transient neonatal pustular melanosis, pallor, gingival cyst, milia, palatine cyst, generalized plethora, and vernix caseosa) and 11 birthmarks (hemangioma, venous malformation, café au lait spots, port-wine stain, mongolian spot, salmon patch, achromic nevus, epidermal nevus, congenital melanocytic nevus, sebaceous nevus, and adnexal polyp). Diagnosis of the lesions was based on clinical assessment.

To compile data from different examinations, weighted means of the proportions were calculated along with confidence intervals (CI) using the binomial method. Statistical analyses were performed with the Metagraph module of Stata 10 (StataCorp, 2009).

Results

Newborn infants were recruited over a period of 19 months between May 2008 and November 2009. The demographic characteristics of the 1000 neonates included in the study were as follows: 528 boys and 478 girls, 92.2% white infants, mean (SD) gestational age of 39.3 (1.8) weeks, mean birthweight of 3234.06 (519.67) grams, mean 1-minute

Table 1 Characteristics of the Selected Studies and the Populations Analyzed

Study	Year	Country	No. of Neonates	Race, Ethnicity, GOP, or Skin Color	Time of Examination	Inclusion Criteria
Monteagudo et al*	2010	Spain	1000	92.2% white 2.9% Roma 2.3% Latin American 2.6% Other	First 72 h	
Boccardi et al ²	2007	Italy	620	79.7% European 6.1% Asian 5.8% North African 3.7% South American 4.5% Other	First 72 h	Only healthy infants (without skin disease)
Gokdemir et al ³	2009	Turkey	572	ND	First 20 d	
Ferahbas et al ⁴	2009	Turkey	650	Skin phototypes II-IV	First mo.	Admitted to a neonatal care unit
Navas et al ⁵	1992	Spain	1,027	ND	Second d	
Moosavi et al ⁶	2006	Iran	1000	ND	First 48 h	
Sachdeva et al ⁷	2002	India	500	ND	First 5 d	
Pruksachatkunakorn et al ⁸	1999	USA	1056	58.3% White 41.7% Black	First 96 h	
Rivers et al ⁹	1990	Australia	420	82.4% White 13.3% Mongolian 2.1% Aboriginal Australian 2.1% Mixed race	First 7 d	
Nanda et al ¹⁰	1989	India	900	ND	First 48 h	

*Our study.

Abbreviations: GOP, geographic origin of parents; ND, not described.

Apgar score of 8.71 (0.82), and mean 5-minute Apgar score of 9.79 (0.54). Infants were born by vaginal delivery in 78.3% of cases. In 83.5% of cases the infants were examined within the first 24 hours of life.

Some type of skin lesion was present in 99.4% of neonates. Transient benign skin lesions were present in 99.2% of newborns and birthmarks in 72%. The 5 most common lesions were sebaceous hyperplasia (75% of neonates), salmon patch (64.2%), hypertrichosis (59%), sucking pad on the lip (54%), and palatine cyst (53.7%).

Table 1 compares the characteristics of the children included in our study with those of 9 other reported studies.²⁻¹⁰ Table 2 compares the findings of the studies. The proportions and corresponding 95% CI are shown for the transient benign skin lesions and birthmarks, along with the weighted means and 95% CI.

Discussion

Our results confirm that, of the 10 most common lesions in newborn infants, 8 are transient benign skin lesions (sucking pad on the lip, physiological desquamation, erythema toxicum neonatorum, sebaceous hyperplasia, hypertrichosis, palatine cyst, generalized plethora, and vernix caseosa) and only 2 are birthmarks (mongolian spots and salmon patches). However, the frequencies observed among the

different studies analyzed are highly variable. For instance, the most common finding was palatine cyst in 3 studies,^{3,7,10} mongolian spots in 2,^{6,8} and physiological desquamation in 2 others,^{6,8} whereas in our study it was sebaceous hyperplasia and others have reported hypertrichosis² or neonatal toxic erythema⁵ to be most prevalent.

Some of the factors that account for these differences are related to the characteristics of the study or the study population:

1. *Racial group.* Whereas mongolian spots, genital hyperpigmentation, hypertrichosis, sucking pads on the lip (in breastfeeding infants), and transient neonatal pustular melanosis are more frequent in black infants, the most common lesions in white infants are palatine cysts, salmon patch, and erythema toxicum neonatorum, perhaps due merely to the greater difficulty of identifying erythema on dark skin.^{2,8,9}
2. *Environmental factors such as climate and temperature inside the hospital.* If the study is undertaken in a hot country or if the temperature inside the hospital is high (without air conditioning), a larger number of neonates develop miliaria, whereas exposure to cold temperatures will be linked to acrocyanosis and cutis marmorata.^{1,7}
3. *Timing of examination or length of follow-up.* The period during which examination took place varied in

Table 2 Proportions and 95% Confidence Intervals for Transient Benign Skin Lesions and Birthmarks. Comparison With 9 Other Studies.

Disease / Study	Monteagudo et al ^a (95%CI)	Boccardi et al ² et al ³	Ferahbas et al ⁴ et al ⁵	Navas et al ⁵ et al ⁶	Moosavi et al ⁶ et al ⁷	Sachdeva et al ⁷ et al ⁸	Pruksachatkunakor et al ⁹ et al ¹⁰	Nanda et al ¹⁰	Mean ^b (95%CI)
All skin diseases	0.994	0.907	0.957	0.960	0.948	1	0.993		
<i>Transient skin lesions</i>	0.992								
Sebaceous hyperplasia	0.750 (0.723-0.776)	0.335	0.318	0.437	0.214	0.387	0.480	0.318	0.429 (0.417-0.441)
Hypertrichosis (lanugo)	0.590 (0.559-0.620)	0.684	0.078	0.257	0.144		0.290	0.290	0.335 (0.322-0.349)
Sucking pad on the lip	0.540 (0.509-0.570)	0.119	0.103				0.098	0.098	0.268 (0.252-0.286)
Palatine cyst	0.537 (0.506-0.567)	0.345 ^c	0.587 ^a	0.702 ^d	0.610 ^d	0.330 ^d	0.560 ^d	0.887 ^d	0.573 (0.560-0.585)
Vernix caseosa	0.492 (0.460-0.523)	0.142							0.358 (0.335-0.382)
Physiological desquamation	0.415 (0.384-0.445)	0.571	0.395	0.019	0.400	0.130	0.650	0.650	0.307 (0.295-0.319)
Plethora (neonatal erythema)	0.306 (0.277-0.334)	0.124							0.236 (0.216-0.258)
Erythema toxicum neonatorum	0.166 (0.142-0.189)	0.231	0.309	0.304	0.210	0.269	0.348	0.206	0.223 (0.214-0.233)
Milia	0.166 (0.142-0.189)	0.234	0.014	0.075	0.238	0.064	0.360	0.349	0.179 (0.170-0.188)
Genital hyperpigmentation	0.153 (0.130-0.175)	0.148							0.151 (0.134-0.170)
Gingival cyst	0.134 (0.112-0.155)								0.134 (0.113-0.157)
Jaundice	0.057 (0.042-0.071)	0.058	0.035	0.291	0.256				0.143 (0.132-0.155)
Pallor	0.023 (0.013-0.032)								0.023 (0.015-0.034)
Sucking pads	0.020 (0.011-0.028)			0.004		0.002			0.008 (0.006-0.012)
TNPm	0.008 (0.002-0.013)		0.003	0.009		0.181			0.057 (0.049-0.065)
Acrocyanosis	0.006 (0.001-0.010)	0.195			0.094				0.082 (0.071-0.095)
Perianal dermatitis	0.005 (0.000-0.009)					0.006			0.005 (0.003-0.010)
Miliaria	0.003 (0.000-0.006)		0.088	0.040	0.206	0.017	0.031	0.146	0.058 (0.052-0.064)
Cutis marmorata	0.001 (0.000-0.002)	0.065	0.106			0.035			0.044 (0.037-0.052)
<i>Birthmarks</i>	0.072								
Salmon patch	0.642 (0.613-0.672)	0.231 ^f	0.192	0.156	0.138	0.346	0.338	0.284	0.282 (0.272-0.292)
Mongolian spots	0.189 (0.164-0.213)	0.010	0.132	0.129	0.602	0.725	0.257	0.622	0.392 (0.381-0.403)
CMN	0.014 (0.006-0.021)	0.032	0.001	0.016	0.020	0.034	0.021	0.004	0.016 (0.013-0.019)
Adnexal polyp	0.010 (0.003-0.016)								0.010 (0.005-0.018)

Table 2 (Continuation)

Disease / Study	Monteagudo et al ^a (95% CI)	Boccardi et al ²	Ferahbas et al ⁴	Navas et al ⁵	Moosavi et al ⁶	Sachdeva et al ⁷	Pruksachatkunakorn et al ⁸	Rivers et al ⁹	Nanda et al ¹⁰	Mean ^b (95% CI)
Hemangioma	0.009 (0.003-0.014)	0.014	0.034 ^c	0.013	0.016	0.018 (0.014-0.022)				
Port wine stain	0.008 (0.002-0.013)				0.003	0.005 (0.003-0.008)	0.009	0.001		
Achromic nevus	0.003 (0.000-0.006)	0.003			0.008	0.005 (0.003-0.008)				
Epidermal nevus	0.002 (0.000-0.004)	0.005	0.003			0.004 (0.002-0.007)	0.010			
Sebaceous nevus	0.001 (0.000-0.002)	0.006	0.003		0.006	0.004 (0.002-0.006)				
Café au lait spot	0.001 (0.000-0.002)	0.013		0.003		0.011 (0.008-0.015)				
Venous malformation	0.001 (0.000-0.002)					0.001 (0.000-0.006)				

^aOur study.

^bWeighted mean for each lesion among the studies that make reference to it.

^cPalatine or gingival cyst.

^dEpstein pearls.

^eThis study distinguished between desquamation (22.7%) and xerosis (31.2%).

^fThis study distinguished between nuchal salmon patch (23.1%) and capillary malformations in other regions (14.7%); either "angiomas".

Abbreviations: CI, confidence interval; CMN, congenital melanocytic nevus; TNPM, transient neonatal pustular melanosis.

different studies from the first 48 hours^{5,6,10} to the first month of life.⁴ Some conditions begin after the first 24 hours of life, including erythema toxicum neonatorum (the majority of cases occur between 24 and 72 hours) and physiological desquamation (except in post-term births).⁶ Miliaria, jaundice, and hemangiomas develop after a few days or weeks. Clinical appearance of some oral (submucosal) cysts is delayed. Other conditions such as vernix caseosa, generalized plethora (due to excess hemoglobin), hypertrichosis, transient neonatal pustular melanosis (in relation to the pustules), or cutaneous vasomotor instability (acrocyanosis and cutis marmorata) disappear or diminish in a few days or weeks.²

4. *Inclusion criteria.* Ferahbas et al⁴ recruited newborns in a neonatal care unit. In that study, 42% of the infants were premature, leading to a higher prevalence of hypertrichosis, hemangioma, and cutis marmorata, and a lower frequency of desquamation (in the first few days), sebaceous hyperplasia, erythema toxicum neonatorum, and oral cysts. If many of the infants have a fever, the frequency of miliaria will be increased.^{1,7,10}
5. *Social and health care provision.* The social and health care services available in a country or region can influence a series of factors that have consequences for the types of lesions observed. These include birthweight (oral cysts and neonatal toxic erythema),⁷ mode of delivery (desquamation and erythema toxicum neonatorum),³ and maternal factors such as age (nuchal salmon patch and erythema toxicum neonatorum),² number of previous pregnancies (erythema toxicum neonatorum and salmon patch),^{4,11} and diseases or the use of pharmacological treatments or supplements (multivitamins, iron, and folic acid) during pregnancy (erythema toxicum neonatorum).²

Additional complexity can be introduced by a series of other factors: a) The first example is terminological differences. Although oral cysts are most frequently located on the palate, Epstein pearls^{3,6-10} differ from palatine or palatine/gingival cysts.² The same is true of sucking pads, leukoedema, and sucking blisters.^{4,9} This last term has been used repeatedly to refer to thickenings of the medial region of the lip and not to sucking blisters characteristically located on the radial edge of the forearm, the wrist, the hand, the dorsum of the thumb, and the index finger.¹² Problems could also occur when comparing vascular lesions with those reported in studies undertaken prior to the subdivision of these into tumors and malformations.¹³ b) The subclassification of diagnoses can also create problems in comparisons between studies. In some studies they distinguish between desquamation and xerosis³ and in others they employ desquamation/xerosis.⁴ c) Another area of confusion is the classification according to lesion site. Boccardi et al,² for instance, distinguished between nuchal salmon patch and salmon patch at other sites. d) Some studies also fail to specify racial group,⁵ and racial categories are also subdivided according to variables that may not be comparable between studies, such as the geographic origin of the parents,^{2,9} race, ethnicity, skin color, or phototype.⁴

Most epidemiologists recognize the scientific limitations of the term “race” and some recommend using the term “ethnic group”.¹⁴ With the increasing ethnic/racial heterogeneity of different populations, it is necessary to employ an appropriate classification.¹⁵ e) Some studies did not examine the oral mucosa (oral cyst and suction pad)^{4,5} or assess the prevalence of certain lesions (vernix caseosa, hypertrichosis, desquamation, flushing, or genital hyperpigmentation).³⁻¹⁰ On occasions, studies are limited to analysis of the 10³ or 31² skin diseases that are traditionally considered to be most prevalent. f) Finally, the use of a weighted mean for comparisons between studies is only appropriate when the grouped percentages are comparable. When this is not the case, the measure has no value.

In conclusion, we observed skin lesions in 99.4% of a group of 1000 newborn infants. The 5 most prevalent conditions were sebaceous hyperplasia (75%), salmon patch (64.2%), hypertrichosis (59%), sucking pad on the lip (54%), and palatine cyst (53.7%). Comparison of the frequency of a given lesion between studies is complicated. In addition to the influence of characteristics specific to the country in which the study was undertaken (climate, social and health care provision, and ethnic groups), we should also consider differences in the time of examination, the inclusion criteria, and the terminology used.

Conflict of Interest

The authors declare that they have no conflict of interest.

Acknowledgments

We are grateful to Dr Ignacio García-Doval from the Department of Dermatology at Complejo Hospitalario Universitario de Pontevedra in Spain, without whose help we would not have been able to carry out the statistical analysis.

References

1. Lucky AW. Transient benign cutaneous lesions in the newborn. In: Eichenfield LF, Frieden IJ, Esterly NB, editors. *Neonatal dermatology*. 2nd edition. Philadelphia: Saunders Elsevier; 2008. p. 85-97.
2. Boccardi D, Menni S, Ferraroni M, Stival G, Bernardo L, La Vecchia C, et al. Birthmarks and transient skin lesions in newborns and their relationship to maternal factors: a preliminary report from Northern Italy. *Dermatology*. 2007; 215:53-8.
3. Gokdemir G, Erdogan HK, Koslu A, Baksu B. Cutaneous lesions in Turkish neonates born in a teaching hospital. *Indian J Dermatol Venereol Leprol*. 2009; 75:638.
4. Ferahbas A, Utas S, Akcakus M, Gunes T, Mistik S. Prevalence of cutaneous findings in hospitalized neonates: a prospective observational study. *Pediatr Dermatol*. 2009; 26:139-42.
5. Navas J, Mazuecos J, Camacho F. A prevalence survey of dermatoses in the southwestern Spanish neonate. *J Eur Acad Dermatol Venereol*. 1995; 4:192-4.
6. Moosavi Z, Hosseini T. One-year survey of cutaneous lesions in 1,000 consecutive Iranian newborns. *Pediatr Dermatol*. 2006; 23:61-3.
7. Sachdeva M, Kaur S, Nagpal M, Dewan SP. Cutaneous lesions in new born. *Indian J Dermatol Venereol Leprol*. 2002; 68:334-7.
8. Pruksachatkunakorn C, Duarte AM, Schachner LA. Skin lesions in newborns. *Int Pediatr*. 1999; 14:28-31.
9. Rivers JK, Frederiksen PC, Dibdin C. A prevalence survey of dermatoses in the Australian neonate. *J Am Acad Dermatol*. 1990; 23:77-81.
10. Nanda A, Kaur S, Bhakoo ON, Dhall K. Survey of cutaneous lesions in Indian newborns. *Pediatr Dermatol*. 1989; 6:39-42.
11. Monteagudo B, Labandeira J, Acevedo A, Cabanillas M, León-Muñoz E, Fernández-Prieto R, et al. Mancha salmón: estudio descriptivo. *Actas Dermosifiliogr*. In press 2010.
12. Heyl T, Raubenheimer EJ. Sucking pads (sucking calluses) of the lips in neonates: a manifestation of transient leukoedema. *Pediatr Dermatol*. 1987; 4:123-8.
13. Kilcline C, Frieden IJ. Infantile hemangiomas: how common are they? A systematic review of the medical literature. *Pediatr Dermatol*. 2008; 25:168-73.
14. Williams HC. Have you ever seen an Asian/Pacific Islander? *Arch Dermatol*. 2002; 138:673-4.
15. Lin SS, Kelsey JL. Use of race and ethnicity in epidemiologic research: concepts, methodological issues, and suggestions for research. *Epidemiol Rev*. 2000; 22:187-202.