Dermoscopy of congenital melanocytic nevi: a ten-year follow-up study and comparative analysis with acquired melanocytic nevi arising in prepubertal age

Background: Dermoscopic characteristics of congenital melanocytic nevi (CMN) have been reported, however, dermoscopic variation during long-term follow-up and direct comparative analyses with acquired melanocytic nevi (AMN) are poorly documented. Objectives: To assess dermoscopic changes of CMN (including lesions present at birth or appearing within the first two years of age) after a long-term period and evaluate possible dermoscopic differences with AMN arising during prepubertal age. Materials & methods: We re-analysed clinical and dermoscopic features of CMN, investigated ten years earlier. New findings were compared with those previously recorded, as well as with those of AMN appearing before puberty in the same group of patients. Results: In total, 493 lesions (86 CMN and 407 AMN) from 71 patients were examined. Except for a greater size (median area: 73.9 vs 22.8 mm²; p < 0.001) and higher prevalence of hair (17.4% vs 4.7; p < 0.001) in CMN, no significant difference was observed between the two cohorts, including global/local dermoscopic features (p > 0.05). The follow-up of CMN revealed that dermoscopic pattern changed in only four lesions (4.7%) (from globular to globular-reticular or reticular) after ten years, though lesions with a globular architecture presented several “local” changes, namely an increase in circumscribed reticular areas (from 20.0% to 41.5%; p = 0.030), irregularly distributed globules (from 15.6% to 34.1%; p = 0.045), and large globules (from 46.7% to 68.3%; p = 0.043). Conclusion: The dermoscopic appearance of CMN is significantly stable during childhood and is similar to that of AMN arising before puberty, thus supporting a possible link between such types of nevi. Key words: acquired melanocytic nevi, congenital melanocytic nevi, dermoscopy, follow-up, prepubertal age, tardive congenital melanocytic nevi

The term “congenital melanocytic nevi” (CMN) classically refers to skin lesions present at birth resulting from the proliferation of benign melanocytes in the dermis, epidermis, or both. They are usually classified according to their size, as small (<1.5 cm), medium (1.5-19.9 cm), or large/giant (≥20 cm) [1-3]. However, many authors also consider the term “congenital” to refer to any melanocytic nevus that appears within the first two years of life (“tardive” CMN) [2], interpreting their late “onset” as the consequence of initial insufficient melanin synthesis and/or small size, which would then make them clinically undetectable during the first months of life [2, 4], or the result of postnatal migration of melanocytic precursor cells from perineural areas to the dermis [2]. Importantly, tardive CMN should not be confused with the so-called “congenital nevus-like nevi”, which are lesions presenting clinical features typical of CMN without a history to conclusively establish their presence since early life [5].

The strict relationship between CMN and tardive CMN is mainly supported by their histological overlap as they share distinctive features, classically not detectable in acquired melanocytic nevi (AMN), including involvement of deep dermal appendages and neurovascular structures, extension of nevus cells to deep dermis and subcutaneous fat, infiltration of nevus cells between collagen bundles, and the presence of a nevus cell-poor subepidermal zone [2, 6]. Moreover, in our previous comparative analysis of 76 CMN and 57 tardive CMN with a diameter ≤3 cm in a cohort of 103 Caucasian children (56 males, 47 females) aged 21-26 months (average: 24 months), we found no difference in terms of dermoscopic appearance between the two types of nevi. This therefore supports the hypothesis of the existence of a group of “congenital-type” melanocytic nevi (CTN) which includes both CMN and tardive CMN [3]. Of note, in such an analysis we included only small-sized nevi and medium-sized nevi up to 3 cm in diameter, not considering
larger lesions in order to avoid dermoscopic images of the same nevus representing different areas within the lesion [3].

Whilst several studies have investigated the dermoscopy of CTN [3, 5, 7-12], there is a lack of studies assessing their dermoscopic changes during long-term follow-up and direct comparative analyses regarding the dermoscopic features of such types of nevi and AMN. In fact, to the best of our knowledge, there are only two long-term follow-up dermoscopic studies on CTN, both of which exclusively involved acral lesions [13, 14].

The aim of this study was to assess dermoscopic changes of CTN in patients who were previously investigated during 2004 in our above-mentioned prior study [3], after a follow-up period of ten years, and also provide a dermoscopic comparative analysis between such nevi and AMN arising during prepubertal age in the same group of paediatric patients.

Patients and methods

The study was performed at the Institute of Dermatology of the San Michele Hospital in Gemona del Friuli (Udine, Italy) during the period of February 2014 to May 2014 (in order to avoid possible summer sun exposure-induced clinical and/or dermoscopic changes). Approval was obtained prior to the study from the Institutional Review Board of the Department of Experimental and Clinical Medicine of the University of Udine, Italy.

Of the 103 Caucasian children comprising the original cohort of our previous study (see introduction), we were able to recruit only 73 patients (40 males and 33 females) due to changes in residence/personal contact details; the average age was 12 years (range: 11 years, 9 months to 12 years, 2 months) and the skin type according to the Fitzpatrick’s classification was III and II in 63.0% and 37.0% patients, respectively.

For each patient, we re-analysed clinical and dermoscopic features of the CTN which had been investigated previously, comparing the new data/images with those recorded ten years earlier (CTN at baseline). Moreover, we also studied the clinical/dermoscopic features of all AMN (defined as any nevus not present during our prior study and therefore presumed to have arisen at between two and 12 years of age, i.e. the patients’ average age in the previous and present analysis, respectively), confronting them with the current findings of CTN.

In both groups (CTN and AMN), we evaluated the total number of lesions and their topography, along with the following additional clinical features: colour (light brown, dark brown/black or variegated), symmetry, edges (regular or irregular), presence or absence of hair, and surface (mammillated or macular).

Regarding the dermoscopic analysis, after obtaining verbal consent from the patients’ parents, representative images of each nevus were acquired at 30x magnification using a digital video-dermatoscope (VIDIX® 5Mpx; MediciMedical, Castelfranco Emilia, Italy) and examined by three different dermatologists in a blinded fashion for both global and local features; the size of the nevi was calculated using specific software.

All lesions were classified with the following global (>50% of the total area) dermoscopic patterns: reticular, globular, cobblestone, reticuloglobular (at least 25% of the surface for each component; i.e. network and globules), pseudoreticular, homogeneous, parallel, starburst, or non-specific. Local features (i.e. typical network, atypical network, small globules, large globules, dots, blotches, streaks, hypopigmented areas, regression structures, veil, and vascular structures) were also assessed.

The pattern of each “congenital-type” melanocytic nevus was defined as “changed” in cases of transition from a given dermoscopic pattern to a different pattern, established using a side-by-side comparison of images taken in our previous study (CTN baseline) and in the present analysis; changes of local features were considered minimal variations.

Statistical analysis

All analyses were performed using Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA, USA). Data are expressed as mean/median values or percentages. Statistical analyses included the unpaired t-test for quantitative variables and the chi-squared test for qualitative variables; all tests were two-tailed and p values of <0.05 were deemed statistically significant.

Results

A total of 493 lesions, 86 (17.4%) CTN and 407 (82.6%) AMN, from 71 patients were examined. Regarding CTN, 61 (83.5%) children had one nevus, 11 (15.1%) had two nevi and one (1.4%) had three nevi, while the average number of AMN per person was 5.57. The area of CTN and AMN ranged from 2.7 to 1,432 mm² and from 1 to 467 mm², respectively, with a significant difference in the median value (73.9 mm² vs 22.8 mm²; p<0.001).

CTN and AMN were located respectively on the lower limbs in 25 (29.1%) and 94 (23.1%) cases, on the upper limbs in 17 (19.7%) and 90 (22.1%) cases, on the trunk in 23 (26.7%) and 99 (24.3%) cases, on the palms in five (5.8%) and 26 (6.4%) cases, on the soles in two (2.3%) and 13 (3.2%) cases, on the buttocks in six (7.0%) and 16 (3.9%) cases, on the face in four (4.7%) and 28 (6.9%) cases, on the neck in three (3.5%) and 19 (4.7%) cases, and on the scalp in one (1.2%) and 22 (5.4%) cases; no lesion was located on the genitals. From a statistical point of view, there was no difference in anatomical distribution between the two types of nevi (p>0.05 for all the aforementioned sites).

Other clinical features of CTN/AMN are reported in table 1: a higher prevalence of hair was the only relevant clinical variable in both cohorts (17.4% vs 4.7% for AMN; p<0.001). Similarly, we found few clinical changes after ten years in the group of CTN, with an increase in the size (median area from 36.2 mm² to 73.9 mm²; p<0.001) and prevalence of variegated colour (from 3.5% to 14.0%; p = 0.015) being the only significant variations (table 1). Concerning dermoscopic findings, we did not observe any relevant difference (p>0.05) in prevalence of global patterns/local features between CTN and AMN (table 2).