Frequency of Dermoscopic Nevus Subtypes by Age, Skin Phototype and Body Site

HESHAM ZAHER, M.D.; DALIA BASSIOUNY, M.D.; RANIA ABD EL-HAY, M.D.; NESREEN SAMIR, M.D. and NANEES RAGAB, M.Sc.
The Department of Dermatology, Faculty of Medicine, Cairo University

Abstract

Background: The dermoscopic patterns of nevi were found to be related to a variety of factors such as age, the patient's pigmentary phototype and the location on the body.

Aim of Study: To detect frequency of dermoscopic nevus subtypes stratified by patient age and skin phototype and location of the nevi.

Patients and Methods: 30 patients were enrolled in the study in which the age and skin phototype were determined. 59 acquired melanocytic nevi were studied. The location was determined. Each nevus was examined dermoscopically in which the diagnosis was confirmed and the global dermoscopic pattern was detected. Nevi were dermoscopically subclassified as globular, reticular and mixed (reticular-globular) pattern.

Results: The commonest dermoscopic subtype in the studied group was the reticular type. A statistically significant association was found between the skin phototype and dermoscopic pattern (p=0.026). Individuals with skin phototype IV were more likely to have a reticular pattern. No statistically significant association was found between age and dermoscopic nevus pattern. No statistically significant association was found between location of nevus and dermoscopic nevus pattern.

Conclusion: The reticular pattern is the commonest dermoscopic nevus pattern in adults. The dermoscopic pattern of nevi is influenced by the skin phototype. The reticular pattern is more common among the darker skin phototypes (phototype IV).

Key Words: Dermoscopic nevus subtypes – Skin phototype.

Introduction

MELANOCYTIC nevi are benign tumors of melanocytes, a cell population with the specific function of pigment synthesis, located primarily in the skin, hair and eyes. Melanocytic nevi are by far the most common benign neoplasms of the skin in the white population [1].

Dermoscopy is a non-invasive tool that is largely recognized and used in the diagnosis of pigmented and non-pigmented skin tumors [2]. It represents a link between clinical and histological views, permitting an earlier diagnosis of skin melanoma [3].

Melanocytic Nevi are classified into 4 main dermoscopic patterns based on common epidemiologic and morphologic features, irrespective of their history (congenital or acquired). These 4 main patterns are the globular, reticular, starburst and homogeneous blue pattern [4].

There is mounting evidence that the patterns of nevi are influenced by age, skin type, location on the body, history of melanoma and pregnancy as well as time-related dynamic changes [4]. Children often have nevi with a globular or structureless pattern (ie, compound and dermal nevi, often shown to have congenital-like features on histopathologic examination). In adults, most nevi show a reticular or reticular mixed pattern (corresponding histopathologically to lentigious, junctional, or compound nevi) [5]. The reticular pattern is more common among the darker skin phototypes [6]. The globular pattern is more common in nevi located on the trunk [5].

Aim of the work:
To detect frequency of dermoscopic nevus subtypes stratified by patient age and skin phototype and location of the nevi.

Patients and Methods

The study was conducted in the Phototherapy Unit of the Dermatology Department in Cairo University. The study was approved by the Research Ethical Committee of the Dermatology Department, Cairo University July 2012-April 2015. Each pa-
tient signed a written informed consent before participation in the study. 40 patients with different dermatological conditions in which NB-UVB was planned for treatment were included in the study.

**Inclusion criteria:**
For each patient at least 2 melanocytic nevi were selected in non sun exposed area and located on healthy skin. All lesions had both benign clinical and dermoscopic features.

**Exclusion criteria:**
Age < 18 years, family history of melanoma or other skin cancers, photosensitivity, atypical mole syndrome.

**Skin phototype determination:**
Skin phototype was detected according to the Fitzpatrick classification (Table 1).

**Dermoscopic analysis:**
A total of 59 Nevi (approximately 2 nevi from each patient) were assessed. Dermoscopic images of nevi from patients were captured under standardized conditions. We used a digital dermatoscope (Dermlite 2 HR PRO). The images were independently evaluated by two investigators. The investigators confirmed the diagnosis of a benign melanocytic nevus. The dermoscopic pattern of each nevus was detected. Nevi were dermoscopically subclassified as globular, reticular, mixed (reticular-globular) pattern.

**Statistical methods:**
Data were statistically described in terms of mean ± standard deviation (±SD), median and range, or frequencies (number of cases) and percentages when appropriate. For comparing categorical data, Chi square ($\chi^2$) test was performed. Exact test was used instead when the expected frequency is less than 5. Correlation between various variables was done using Pearson moment correlation equation for linear relation in normally distributed variables and Spearman rank correlation equation for non-normal variables/non-linear monotonic relation.

$p$-values less than 0.05 was considered statistically significant. All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 15 for Microsoft Windows (2006).

**Results**

This study included 40 patients with clinically acquired melanocytic nevi. However 10 patients dropped out due to personal circumstances. The enrolled patients were 19 (63%) females and 11 (36%) males. Age of patients ranged from 18 to 62 years with a mean age of 36.42 ± 14.038. As regards skin type, 22 (73%) patients were skin type IV and 8 (26%) patients were skin type III. A total of 59 Nevi (approximately 2 nevi from each patient) were assessed. Dermoscopic evaluation revealed 16 (27.1%) globular nevi, 37 (62.7%) reticular nevi and 6 (10.2%) mixed nevi Fig. (1). As regards site 7 (11.9%) were located on the abdomen, 8 (13.6%) on the chest, 19 (32.2%) on the back, 7 (11.9%) on the arm, 6 (10.2%) on the forearm, 3 (5.1%) on the buttocks, 3 (5.1%) on the thighs and 4 (6.8%) on the legs.

**Fig. (1):** Reticular nevi represented the majority of nevi 63%, globular nevi represented 27% and mixed nevi represented 10%.

**Association between age and dermoscopic nevus pattern:**
No statistically significant association was found between age and dermoscopic pattern of nevus (Tables 2,3).

**Table (2):** Association between age and dermoscopic pattern of nevus.

<table>
<thead>
<tr>
<th>Nevus pattern</th>
<th>Minimum (yrs)</th>
<th>Maximum (yrs)</th>
<th>Mean (yrs)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globular</td>
<td>21</td>
<td>57</td>
<td>33.31</td>
<td>0.401</td>
</tr>
<tr>
<td>Reticular</td>
<td>16</td>
<td>62</td>
<td>38.59</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>20</td>
<td>56</td>
<td>31.33</td>
<td></td>
</tr>
</tbody>
</table>
Table (3): Association between age group and dermoscopic pattern of nevus.

<table>
<thead>
<tr>
<th>Nevus pattern</th>
<th>Age</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤25yrs (n=11)</td>
<td>&gt;25yrs (n=19)</td>
</tr>
<tr>
<td>Globular (n=16)</td>
<td>5 (31.3%)</td>
<td>11 (68.8%)</td>
</tr>
<tr>
<td>Reticular (n=37)</td>
<td>13 (35.1%)</td>
<td>24 (64.9%)</td>
</tr>
<tr>
<td>Mixed (n=6)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
</tr>
</tbody>
</table>

Association between skin phototype and dermoscopic nevus pattern:

A statistically significant association was found between the skin phototype and dermoscopic pattern of nevus (p-value=0.026). 31/37 (83.8%) of reticular nevi were in patients with skin phototype IV (Table 4).

Table (4): Association between skin phototype and dermoscopic pattern of nevus.

<table>
<thead>
<tr>
<th>Nevus pattern</th>
<th>Skin phototype</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>Globular (n=16)</td>
<td>4 (25%)</td>
<td>12 (75%)</td>
</tr>
<tr>
<td>Reticular (n=37)</td>
<td>6 (16.2%)</td>
<td>31 (83.8%)</td>
</tr>
<tr>
<td>Mixed (n=6)</td>
<td>4 (66.7%)</td>
<td>2 (33.3%)</td>
</tr>
</tbody>
</table>

p-value <0.05 is significant.

Association between site of nevus and dermoscopic nevus pattern:

No statistically significant association was found between site of nevus and dermoscopic pattern of Nevus (Table 5).

Table (5): Association between site of nevus and dermoscopic pattern of nevus.

<table>
<thead>
<tr>
<th>Nevus pattern</th>
<th>Site of nevus</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trunk (n=34)</td>
<td>Extremities (n=25)</td>
</tr>
<tr>
<td>Globular (n=16)</td>
<td>9 (56.3%)</td>
<td>7 (43.8%)</td>
</tr>
<tr>
<td>Reticular (n=37)</td>
<td>22 (59.5%)</td>
<td>15 (40.5%)</td>
</tr>
<tr>
<td>Mixed (n=6)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
</tr>
</tbody>
</table>

Discussion

In this study 59 Nevi from 30 patients were assessed dermoscopically. The majority of nevi were reticular which has been previously reported to be the commonest pattern in adults [5,7-9]. In our study the reticular pattern was observed in 63% of nevi. Similar frequencies were previously reported. Zaludek et al., 2006 reported a frequency of 60%. However studying the predominant nevus subtype in patients ≤25 years in comparison to those >25 years no statistically significant association was found between the age group and dermoscopic pattern of nevus.

In contrast the globular and homogenous patterns were reported as the most prevalent nevus patterns in children [5-7,10].

The significant age-related differences in the predominance of globular and of reticular nevi support the hypothesis that they represent distinct pathways to nevogenesis. One pathway, the constitutional or endogenous pathway, gives rise to nevi with a globular or structureless dermoscopic pattern, an unspecified dermoscopic pattern, with onset during childhood. These nevi are thought to derive from predominantly dermal melanocytes and represent persisting proliferations that acquire, with time, the stereotypical appearance of an intradermal nevus. In contrast, the acquired or exogenous pathway of nevogenesis gives rise to nevi with a reticular dermoscopic pattern. The most likely exogenous factor resulting in nevogenesis is intermittent UV light exposure resulting in the proliferation of epidermal melanocytes, which have a propensity to involute over time. Thus, nevus pattern was predicted to be age dependent; reticular nevi would appear and involute during adult life, and globular structureless nevi would appear in youth and persist indefinitely [5].

The early onset of globular nevi, as opposed to the later predominance of reticular nevi, is also in line with the notion that globular nevi are more likely to be congenitally determined and that reticular nevi may be more driven by exogenous influences such as UV light [8]. This is further supported by a study showing significant age-and anatomic site-related differences between clinically flat (ie, nevi with a presumably reticular pattern by dermoscopy) and nodular (ie, nevi with a presumably-globular pattern by dermoscopy) nevi [9].

Our study did not demonstrate a statistically significant association between the anatomic location of nevus and dermoscopic nevus subtype. Witt and Krengel, 2010 previously reported that reticular nevi are more concentrated on the upper arms and thighs. This could be explained by our preference of non sun exposed nevi in the study.

Our study showed a statistically significant association between the skin phototype and dermoscopic subtype of nevus. The reticular pattern was more common among the darker skin phototype IV. This finding agrees with Zaludek et al., 2007 and Scope et al., 2008.
Also reticular nevi were found to be the predominant pattern among the darker skin phenotypes [6,8] which was the case in our study. The higher prevalence of reticular pattern naevi in darker individuals may be related to higher constitutive activity of melanocytes and/or enhanced transfer of melanin to keratinocytes [6].

Conclusion:
The reticular pattern is the commonest dermoscopic nevus pattern in adults. The dermoscopic pattern of nevi is influenced by the skin phototype. The reticular pattern is more common among the darker skin phototypes (phototype IV).

Further studies on a larger sample size and different age groups and different skin phototypes are recommended. Further studies are needed to better clarify the role of UV irradiation on nevogenesis and its influence on dermoscopic nevus patterns.

References