Dermoscopic analysis of nevus pigmentosus

Ira Mendrofa¹*, Imam Budi Putra², Nelva K. Jusuf²

INTRODUCTION

Nevus pigmentosus is a benign melanocytic skin lesion that occurs as a result of proliferation of melanocytes in skin tissue.¹,² Melanocytes are skin pigment-producing cells and are commonly found in the epidermis, dermoeipidermal, and hair follicles. Some benign neoplasms usually originate from melanocytes and individual oncogenic mutations.³,⁴

The cause of this nevus is still uncertain. Several studies reported that the main cause of melanocytic nevus is sun exposure during childhood. The use of sunscreen is reported to reduce the formation of new nevus on areas of the body exposed to sunlight. Neonatal phototherapy is also a strong risk factor for nevus formation in childhood.⁵,⁶

Histopathological examination is the gold standard for the diagnosis of pigmented skin lesions, but is time consuming and invasive. In addition, there is also a dermoscopy examination to diagnose pigmented skin lesions quickly and non-invasively.⁷⁻¹³ This method is equipped with magnifying lenses and lights to reveal skin appearances that cannot be seen with the naked eye. Dermoscopy can increase the diagnostic accuracy and confidence level of clinicians to examine melanocytic and non-melanocytic pigmented lesions by visualizing the structures beneath the stratum corneum to the depths of the superficial dermis. However, this method is not a substitute for histopathological examination.¹⁴⁻¹⁵

Muradia et al. in his research it was concluded that clinical diagnosis correlated with histopathological features, so that dermoscopy examination is very helpful for early detection of pigmented skin lesions.¹⁶ Another study by Malladi et al. reported that dermoscopy is helpful for the diagnosis of benign melanocytic lesions.¹⁷

Dermoscopy examination can be used by clinicians to identify the color and structure of nevus pigmentosus with a diagnosis according to color, pattern, and pigment criteria.¹⁸⁻¹⁹ Variations in the form of nevus pigmentosus at each location of the body are still being studied, therefore the aim of this study is to analyze dermoscopy on nevus pigmentosus.

METHODS

This research was a descriptive study with a cross-sectional design. This research was conducted at the Universitas Sumatera Utara Hospital from July 2022 to May 2023. This research has received approval from the Research Ethics Commission of the Universitas Sumatera Utara and the Universitas Sumatera Utara Hospital. The population were workers and students of the Universitas Sumatera Utara Hospital who have nevus pigmentosus as many as 118 people. Research status

ABSTRACT

Introduction: A benign melanocytic skin condition known as nevus pigmentosus or nevomelanocytic is caused by the proliferation of melanocytes in the epidermis where pigment-producing cells aggregate. Nevus can be found all over the body. The face, scalp, trunk, extremities and other areas frequently exposed to the sun are the most common places. Nevus is a special sign of a person in the location of the body as a sign of identity both clinically and dermoscopy. The aim of this study was to analyze the dermoscopy appearance of nevus pigmentosus.

Methods: Cross-sectional study using consecutive sampling methods on workers and students at the Universitas Sumatera Utara Hospital from July 2022 – May 2023. The researchers recorded basic data, and the diagnosis of nevus pigmentosus was established through anamnesis, sampling and dermatological examination.

Results: This research has received approval from the Research Ethics Commission of the Universitas Sumatera Utara and the Universitas Sumatera Utara Hospital. The number of nevus pigmentosus patients was 118 patients with 860 nevus. Most body locations were found in the superior extremities 315 nevus (36.6%) and face 222 nevus (25.8%). The color of the most frequently identified nevus was brown 821 (95.5%) with the highest pattern being reticular 675 (78.9%). Based on the pigment distribution of the nevus pigmentosus, 327 (38.3%) were uniform and central hyperpigmentation was 236 (27.4%), which was the most common.

Conclusion: The conclusion is that nevus pigmentosus is most commonly found on the superior extremities, brown, have a reticular pattern with uniform pigmentation.

Keywords: dermoscopy features, nevus pigmentosus, body location.


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contains anamnesis, skin dermatological examination and dermoscopy of research subjects, ILLUCO® IDS 1100 Dermoscope, digital camera and alcohol swab. Basic data recording was carried out by researchers including subject identity, anamnesis, dermatological examination of the skin and dermoscopy. After the subject signed an informed consent, it was followed by a dermoscopy examination. The examiner is to the right of the subject and cleans the area of the lesion to be examined with an alcohol swab. Dermoscopic examination by placing an object lens in the lesion area and adjusting the magnification to get a clear dermoscope image. The dermoscopic appearance of nevus pigmentosus is assessed based on the color, pattern, and pigment at the location of the body. The examiner documents the results of the inspection.

The data that has been collected, then analyzed. The data will be presented in the form of a frequency distribution table.

**RESULTS**

**Demographic Characteristics Based on Number of Nevus for Each Body Location**

Demographic characteristics based on the number of nevus for each body location can be seen in table 1 below.

<table>
<thead>
<tr>
<th>Body location</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>97</td>
<td>11.3</td>
</tr>
<tr>
<td>Face</td>
<td>222</td>
<td>25.8</td>
</tr>
<tr>
<td>Neck</td>
<td>89</td>
<td>10.3</td>
</tr>
<tr>
<td>Thorax</td>
<td>79</td>
<td>9.2</td>
</tr>
<tr>
<td>Abdomen</td>
<td>24</td>
<td>2.8</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>315</td>
<td>36.6</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>34</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>860</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Distribution of Nevus Pigmentosus Dermoscopy Based on Pigment Pattern**

Distribution of nevus pigmentosus dermoscopy based on pigment pattern can be seen in table 3 and figure 2 below.

**Distribution of Nevus Pigmentosus Dermoscopy Based on Pigment Distribution**

Distribution of nevus pigmentosus dermoscopy based on pigment can be seen in table 4 and figure 3 below.

**DISCUSSION**

The results showed that the total number of nevus pigmentosus found was 860 nevus (See Table 1). The division of the main locations of the body is head, face, neck, thorax, abdomen, upper and lower extremities. The results of the study show that the highest number of nevus pigmentosus was found in the upper extremities (36.6%) and face (25.8%). Research Islamiyati et al. found the same result where the nevus pigmentosus mostly occurs on the head (81%). However, the results of Ian Pratama that face and scalp nevus 50 (90.9%) is the location of the most nevus found, while the neck and upper extremities are the most rare cases found (1.8%).

Nevus is most commonly found on the head, face, neck and upper extremities because these areas are usually exposed to the sun more often than areas that are rarely exposed, such as the abdomen, soles of the feet and lower extremities. Areas that are frequently exposed to the sun (UV rays) have 2 times the number of melanocytes and are more frequently found in cases of nevus pigmentosus than areas that are not exposed to the sun.

The color of the nevus pigmentosus found in the subject was brown (95.5%) and the least was a blue nevus (0.3%) (See Table 2). The results of this study are in line with the research of Lu et al. that nevus pigmentosus which is commonly found has a light brown to dark brown color.

The location of the pigmented melanocytes in the deep dermis gives rise to the characteristic clinical color of melanocytosis. The depth of pigment changes the color seen on dermoscopy. The black color indicates the location of the pigment in the superficial epidermis, the brown color indicates the location of the pigment in the epidermis, the gray color indicates the location of the pigment in the papillary dermis, and the color blue
indicates the location of the pigment in the reticular dermis.\textsuperscript{25,26}

The results of this study found that the most common nevus pigmentosus pattern was the reticular pattern (78.9%), followed by a mixed pattern on the face (2.9%) (See table 3). This result is in line with Zalaudek et al. that the reticular pattern is more common.\textsuperscript{27} These results differ from those of Lu et al. that more globular patterns are found.\textsuperscript{24}

The reticular pattern displays the presence of melanin in keratinocytes or melanocytes along the dermo-epidermal junction in melanocytic lesions, in the form of a honeycomb type network consisting of pigmented lines as rete ridge projections, and hypopigmented holes as projections of the dermal papillae.\textsuperscript{28,29}

The results of the study found that the distribution of pigments found most are uniformly pigmented (38.3%) and mostly found in the upper extremities (18.5%) (See Table 4). Distribution of hyperpigmented and hypopigmented multifocal pigments (10.5%) on the face, while the distribution of hyperpigmented central pigments, central hypopigmentation, eccentrics hyperpigmentation, and eccentrics hypopigmented were most commonly found in the upper extremities with respectively nevus of (8.6%), (1.3%), (1.9%), and (4.6%).

This result is in line with the research of Zalaudek et al. who get a uniform pattern.\textsuperscript{1} Nevus with uniform pigment distribution is a nevus that has even distribution of pigmentation throughout the lesion and is almost always benign. Nevus has a size smaller than 6 mm with uniform pigmentation and smooth edges, generally found in locations exposed to sunlight.\textsuperscript{30} This opinion supports the results of this study that nevus with uniform distribution of pigment is found in the upper extremities which are often exposed to sunlight.

Central hyperpigmentation is the term used for describes the type of hyperpigmentation that occurs in a melanocytic nevus which is a benign skin lesion consisting of melanocytes. Central hyperpigmentation refers to the presence of a darker area in the center of the nevus, which may be surrounded by lighter areas. Some studies have shown that central hyperpigmentation is associated with a higher risk of melanoma, while others have shown a risk of benign nevus.\textsuperscript{31}

Figure 1. Dermoscopic appearance of nevus pigmentosus based on color, (a) black, (b) brown, (c) blue.

Table 3. Distribution of nevus pigmentosus dermoscopy based on pigment pattern

<table>
<thead>
<tr>
<th>Body location</th>
<th>Globular</th>
<th>Reticular</th>
<th>Mix</th>
<th>Unstructured</th>
<th>Parallel furrow</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>Head</td>
<td>11</td>
<td>1.3</td>
<td>68</td>
<td>7.9</td>
<td>13</td>
<td>1.5</td>
</tr>
<tr>
<td>Face</td>
<td>16</td>
<td>1.9</td>
<td>179</td>
<td>20.9</td>
<td>25</td>
<td>2.9</td>
</tr>
<tr>
<td>Neck</td>
<td>6</td>
<td>0.8</td>
<td>66</td>
<td>7.8</td>
<td>13</td>
<td>1.5</td>
</tr>
<tr>
<td>Thorax</td>
<td>4</td>
<td>0.4</td>
<td>67</td>
<td>7.9</td>
<td>8</td>
<td>0.8</td>
</tr>
<tr>
<td>Abdomen</td>
<td>5</td>
<td>0.5</td>
<td>14</td>
<td>1.7</td>
<td>4</td>
<td>0.4</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>16</td>
<td>1.9</td>
<td>256</td>
<td>29.8</td>
<td>23</td>
<td>2.8</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>1</td>
<td>0.1</td>
<td>25</td>
<td>2.9</td>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>6.9</td>
<td>675</td>
<td>78.9</td>
<td>91</td>
<td>10.4</td>
</tr>
</tbody>
</table>

CONCLUSION

The most common location of nevus pigmentosus was found in the upper extremities (36.6%) with brown pigment color (95.5%), reticular pattern (78.9%), and uniform pigment (38.3%).

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ETHICAL CLEARANCE

This research has received approval from the Research Ethics Commission of the Universitas Sumatera Utara with No: 115/KEKP/USU/2023 and the Universitas of Sumatera Utara Hospital with No: 683/UN5.4.1.1.3/KPM/2023.

FUNDING

No specific funding was received for this study.

CONFLICT OF INTEREST

None to declare.

AUTHOR CONTRIBUTIONS

All authors work equally in doing this research and writing this research article.
Figure 2. Dermoscopic appearance of nevus pigmentosus based on pattern, (a) globular, (b) reticular, (c) mixed, (d) unstructured, (e) parallel furrow.

Figure 3. Dermoscopic appearance of nevus pigmentosus based on pigment distribution, (a) uniform, (b) multifocal hyperpigmentation and hypopigmentation, (c) central hyperpigmentation, (d) central hypopigmentation, (e) eccentric hyperpigmentation, (f) eccentric hypopigmentation.

REFERENCES