



Original Research Article

Assessment of clinical and etiological factors in nail dyschromias

Lalitha C¹, Shwetha S^{2,*}, Asha G S³¹Dept. of Dermatology, Shridevi Institute of Medical Sciences and Research Hospital, Tumkur, Karnataka, India²Dept. of Dermatology, Sambhram Institute of Medical Sciences and Research, KGF, Karnataka, India³Dept. of Dermatology, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India

ARTICLE INFO

Article history:

Received 16-09-2021

Accepted 21-10-2021

Available online 11-12-2021

Keywords:

Melanonychia

Chromonychia

ABSTRACT

Background: Healthy nails appear smooth and have consistent coloring. Nail dyschromias have a wide variety of presentation. There are numerous causes of discoloration of the nail affecting the nail plate, nail attachments, or the substance of the nail. Different pattern of nail dyschromias can point out certain dermatological or systemic diseases.

Aim: To evaluate the causes of nail dyschromias in our clinical setting.

Setting and Design: Cross sectional observational study.

Methods and Materials: 200 patients presenting with nail dyschromias were included in the study from April 2015 to July 2015. Detailed history was taken and cause for nail dyschromias was evaluated.

Results: 115(57.5%) were males and 85(42.05%) were females.

The most seen nail dyschromia in this study was melanonychia (86.5%) followed by leukonychia (5%), blue chromonychia (5%), brown chromonychia (2%) yellow chromonychia (1.5%). The cause of nail dyschromias were: 60 cases(33.33%) were due to antiretroviral drugs, 25(12.5%) due to HIV, 30(15%) physiological melanonychia, 7(3.5%) of onychomycosis, 8(4%) of lichen planus, 7(3.5%) of eczema, 15(7.5%) vitamin B12 deficiency, 10(5%) chemotherapy induced blue chromonychia, 3(1.5%) haematoma, 10(5%) leukonychia, 3(1.5%) jaundice 2(1%) Addison's disease induced, 3(1.5%) cosmetic induced and 17(7.5%) due to other dermatological and systemic conditions.

Conclusions: Examination of nail should always be a part of routine cutaneous examination and presentation with nail dyschromias should be worked up with the help of a good history and examination. Careful examination of the nail may help in identifying the root cause and many a times unravels some underlying systemic disorder

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Nail abnormalities can be a revealing sign of a systemic disease. Nail dyschromia or chromonychia is defined as an abnormality in the color of the substance or the surface of the nail plate or subungual tissue.¹ The discoloration specifically due to the deposition of melanin is labeled as nail pigmentation.¹ Melanonychia, as a variant, is defined

as brown or black pigmentation of nails.^{1,2}

Nails of both limbs should be always examined in totality apart from the affected nail, preferably prior to the examination of the affected nail to avoid bias. However, prior to this, a detailed history is necessary, especially to rule out presence of any exogenously added pigmentation of the nail (e.g. Henna). When the discoloration is secondary to exogenous agents, the pattern lies along the curve of the proximal nail fold; if internal, follows the curve of the lunula.²

* Corresponding author.

E-mail address: shwetha.215@gmail.com (Shwetha S).

A working anatomical knowledge of the nail, its attachments and the underlying tissues is imperative to analyze the factors that cause discoloration of an otherwise transparent nail.¹ A systemic disease can affect one or all nails simultaneously, but a localized affect can alter the colour of the one or two nails maximally, limiting the involvement.² In addition, a quick but thorough cutaneous and mucosal examination is desired as these may many a times provide an important clue to an underlying disease. Few morphological changes might occur otherwise in an apparently normal healthy individual. An idea of this may help avert unnecessary work up in these individuals.³

There can be several causes of Melanonychia, a brief description of which is mentioned in Figure 1.

2. Materials and Methods

The aim of the study is to find out the different causes of nail dyschromias. It was a cross sectional study done from April 2015 to July 2015 at tertiary hospital in Bangalore. 200 patients above the age of 18 years, presenting with nail discoloration were included in the study. A detailed history including occupation, hobbies, and illnesses (systemic and dermatological), medications, past treatments, family history, trauma to the nail, type of footwear, manicure and pedicure treatment was noted in a semi structured pro forma.

Routine blood investigations like Complete hemogram with peripheral smear, Liver function test, renal function test, Random blood sugar, ELISA for HIV 1 & 2, Serum Vitamin B12 were done. Wherever deemed necessary, a nail biopsy and scrapings was performed.

The data was then entered in an MS excel spreadsheet. The statistical analysis was done using SPSS v21. The categorical data was represented as frequencies and proportions, while the quantitative data was represented as mean, median and IQR.

3. Results

115 (57.5%) were males and 85 (42.05%) were females (Graph 1).

More than 50% patients were in the age group between 30 to 50 years (Graph 2).

Laborers constituted the highest portion amongst the study participants, followed closely by computer operators.(Graph 3)

On analysis of the lab parameter, 22.5% participants had Hb less than 8 gm/dL. 12.3% of the study participants had serum creatinine more than 2.0 mg/L. Deranged liver function was observed in 12.45% participants. ELISA done for HIV I and II was reactive in 48.02% of the study participants with melanonychia. Vitamin B12 deficiency was observed in 14.12% of the study participants with melanonychia (Graph 4).

The most seen nail dyschromia in this study was melanonychia (86.5%) followed by leukonychia (5%), blue chromonychia (5%), yellow chromonychia (1.5%) and 0.5% of other color chromonychia (orange exogenous henna nail discoloration and one green nail associated with). Longitudinal Melanonychia, was the most seen, transverse, and subtotal melanonychia were seen in few cases (Graph 5). It involved both fingernails and toenails (fingernails> toenails). In fingernails, it was seen more in thumbnails and index and middle fingers and in toe nails, Great toe nail involvement was observed. The different types of nail dyschromias photographs are shown in figures (Figures 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21).

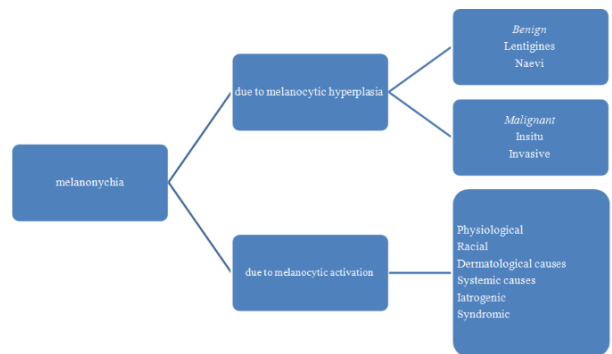
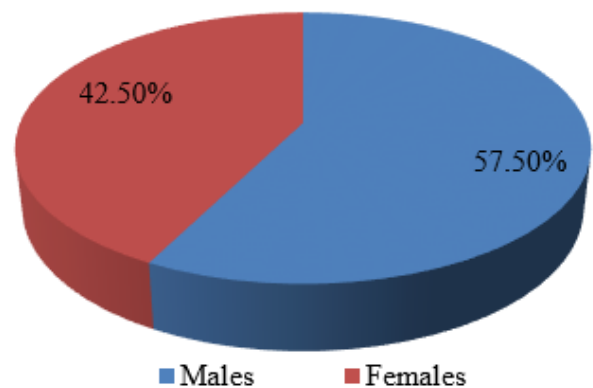


Fig. 1: Causes of melanonychia



Fig. 2: Melanonychia in HIV patient



Graph 1: Male and female distribution



Fig. 3: Melanonychia caused by Zidovudine



Fig. 6: Melanonychia in psoriasis



Fig. 4: Terry's nails

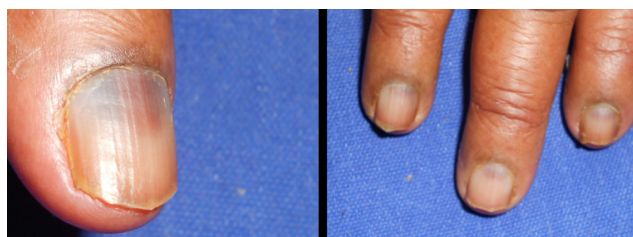


Fig. 7: Doxorubicin induced blue chromonychia



Fig. 8: Cyclophosphamide induce chromonychia



Fig. 5: Physiological melanonychia



Fig. 9: Fungal melanonychia



Fig. 10: Fungal Brown chromonychia



Fig. 14: Systemic lupus erythematosus and antimalarial induced pigmentation



Fig. 11: Orange chromonychia (exogenous due to henna)



Fig. 15: Melonachia in Dystrophic epidermolysis bullosa patient



Fig. 12: Melanonychia due to lichen planus



Fig. 13: Melanonychia due to pemphigus with onychomadesis



Fig. 16: Traumatic blackish nail discoloration



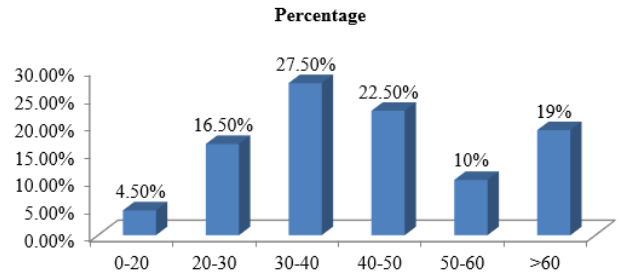
Fig. 17: Bleomycin induced nail pigmentation



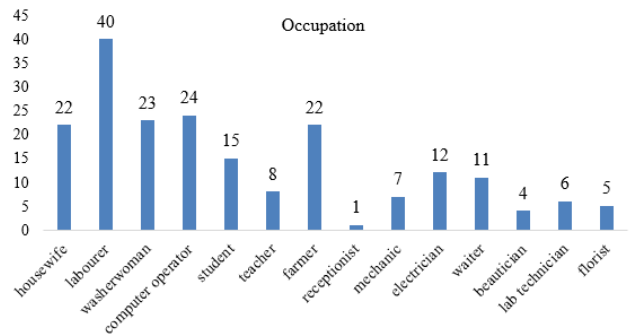
Fig. 18: Melanonychia with crescent leuconychia



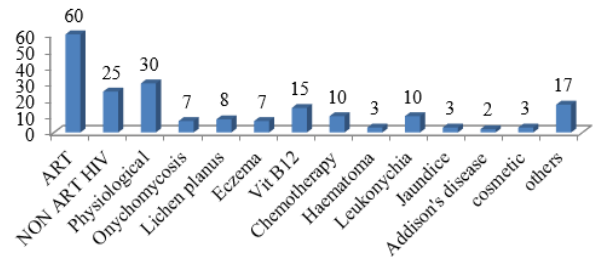
Fig. 19: Punctate leuconychia



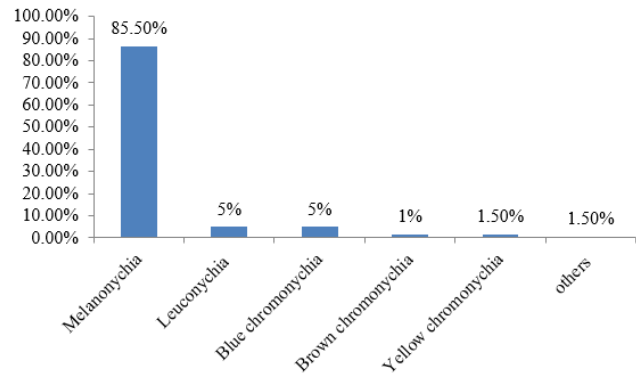
Graph 2: Age distribution



Graph 3: Occupation of the patients



Graph 4: Different causes of dyschromias



Graph 5: Types of dyschromias

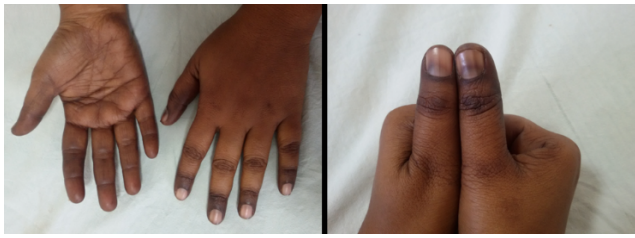


Fig. 20: Vitamin B12 deficiency nails with pigmentation in palmar creases



Fig. 21: Longitudinal erythronychia with V nicking of nails in darier's disease

4. Discussion

Nail dyschromias as a common disorder encountered by dermatologists, even general practitioners, on a day-to-day basis. This is secondary to pigmentation of the nail bed or plate and can be attributed to various endogenous (localized or systemic) or exogenous causes. The type of the nail dyschromia depends on the pigment deposited, the region and its duration.

In this study, majority of the patients belonged to the age brackets of 30-50 years. This was like the findings in a study done by Soo Hyeon Bae et al, the mean age was 43.6 ± 23.8 years. 57.5% of the patients were male, which was like the findings by Soo Hyeon Bae et al.⁴

Hobbies play an important role in the identification of the cause of nail dyschromia, as they contribute as an exogenous factor. In our study, we found that sports was the most common hobby amongst the study participants. This was like the findings in a study done by Yildirimer L et al,⁵ where injuries due to sports related trauma (crush injuries) was a leading cause of nail dyschromia.

Anaemia is one of the causes of apparent leukonychia, a cause of nail dyschromia. In our study we found that 22.5% patients had anaemia. In a study by Braun et al,⁶ anaemia was observed in those with leukonychia, due to blanching of the nail bed. In a study done by Soo Hyeon Bae et al,⁴ incidence of anaemia was 38.5%. Half and half nails can be seen with those with deranged liver function, however in this study we didn't report any such case in those patients with raised bilirubin. Chronic renal failure can also cause nail dyschromias, in this study 12.3% participants had raised serum creatinine. In a study done by Soo Hyeon Bae et al,⁴ 15.4% patients had chronic renal failure.

Melanonychia was the most common dyschromia (85.5%) seen in this study. In the present study, drug induced and systemic infection like HIV contributed largely to melanonychia whereas local and dermatological conditions contributed to few. This is in accordance with other studies done on nail pigmentations.

Among the drug induced, 30% were due to antiretroviral drugs like zidovudine, lamivudine, others were due chemotherapeutic agents and antimalarials. This can be attributed to the cause that our institute was referral centre for HIV and ART centre. In this study, we did not find any subungual melanoma or naevus or wart presenting with melanonychia. However, in a study done by Soo Hyeon Bae et al, 33.3% patients had naevus of the nail matrix.

In this, we observed 10 cases (5%) of blue nails, which was due to chemotherapeutic medication like doxorubicin, cyclophosphamide and antimalarials. In a study done by Soo Hyeon Bae et al, blue nails was seen only in a small percentage of the study population (1.3%). In a study done by P F Levey and team⁷ in Africans, they found that HIV infection and the treatment is a cause for blue nails. Yellow discoloration of nails (5 in number) was seen in 2 cases of onychomycosis and in 3 cases of jaundice due to liver disorder. In a study by Brzeziński P et al,⁸ the cause of the yellow nail discoloration was due to chronic pulmonary disease. Similar findings were recorded by Piraccini and team.⁹ We found one case each on longitudinal erythronychia in Darier's disease, green nails due to pseudomonas infection and orange discoloration of nails due to henna.

5. Conclusion

Nail being a small apparatus can reveal underlying systemic or local disorders. It's important to examine nail routinely and worked up with detailed history and investigations

6. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

7. Source of Funding

None.

References

1. Jeanmougin M, Civatte J. Nail Dyschromia. *Int J Dermatol*. 1983;22(5):279–90.
2. Mendiratta V, Jain A. Nail. Symposium-Nails Part I. *Indian J Dermatol Venereol Leprol*. 2011;77(6):652–8. doi:10.4103/0378-6323.86473.
3. Baran R, Dawber RP. Physical science. In: Baran R, Dawber R, Hanché E, editors. Diseases of the nail and its management. London: Blackwell Science; 2001. p. 85–103.
4. Bae SH, Jang SH, Won YH. Twenty-Nail Dystrophy Treated with Hydroxychloroquine in a Patient with Alopecia Areata. *Ann Dermatol*. 2019;31(3):359–61. doi:10.5021/ad.2019.31.3.359.
5. Yildirimer L. Experience of nail bed injuries at a tertiary hand trauma unit: A 12-month review and cost analysis. *J Hand Surg*. 2019;44(4):419–23. doi:10.1177/1753193419826465.
6. Braun RP, Baran R, Gal FAL, Dalle S, Ronger S, Pandolfi R, et al. Diagnosis and management of nail pigmentation. *J Am Acad Dermatol*. 2007;56(5):835–47. doi:10.1016/j.jaad.2006.12.021.
7. Levay PF, Botes ME, Malela E. Dyschromonychia: clinical significance in a South African population. *SA Fam Pract*. 2005;47(9):54–9.
8. Brzeziński P, Bury M, Jagiełło-Wieczorek E. Coexistence yellow nail syndrome with systemic symptoms. *N Dermatol Online*. 2010;1(2):15–8.
9. Piraccini BM, Urciuoli B, Starace M, Tosti A, Balestri R. Yellow nail syndrome: Clinical experience in a series of 21 patients. *J Dtsch Dermatol Ges*. 2014;12(2):131–7.

Author biography

Lalitha C, Assistant Professor

Shwetha S, Assistant Professor

Asha G S, Professor

Cite this article: Lalitha C, Shwetha S, Asha G S. Assessment of clinical and etiological factors in nail dyschromias. *IP Indian J Clin Exp Dermatol* 2021;7(4):324-330.