



# Nail disorders: Kids are not just little people

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**Abstract** Nail disorders comprise an important subset of dermatologic conditions and often pose both diagnostic and therapeutic challenges to the clinician. Presentation and management can differ in adults and children. Proper understanding of these differences is important in delivering optimal patient care. This contribution discusses three common nail disorders in adults and children, onychomycosis, melanonychia striata, and trachyonychia, highlighting distinct features in the adult and pediatric populations.

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Nail disorders comprise an important subset of dermatologic conditions and often pose both diagnostic and therapeutic challenges to the clinician; furthermore, nail diseases often have distinct presentations and characteristics in children and adults and may require different treatment strategies. The purpose of this paper is to review three of the most common nail conditions seen in dermatologic practice, onychomycosis, melanonychia, and trachyonychia, with an emphasis on highlighting the differences observed between adults and children. (See Figs. 1–3.)

## How is onychomycosis similar in children and adults?

Onychomycosis is the most common nail disorder affecting adults, occurring in at least 10% of the general population (Table 1).<sup>1,2</sup> In contrast, children are much less often affected, with reported incidence ranging from 0.4% to 2.6%.<sup>3,4</sup> The presence of onychomycosis in a child is a strong predictor for an affected household contact, with one study noting a 65% incidence of onychomycosis in at least one family member.<sup>3</sup>

In both children and adults, onychomycosis preferentially involves the toenails compared with the fingernails; however, in children, a greater proportion of cases involves the fingernails and historically fingernail onychomycosis was reported to be more prevalent than toenail onychomycosis. The proportion of onychomycosis affecting only the fingernails in children ranges in series but is currently thought to be between 10% and 34%,<sup>3,5–7</sup> whereas in adults that figure is closer to 5%.<sup>8</sup> Onychomycosis of the fingernails has the highest incidence in children younger than 3 years of age.<sup>6</sup>

The most common clinical type of onychomycosis in both adults and children is distal lateral subungual onychomycosis. Superficial white onychomycosis is another common presentation in the pediatric population, with reported rates of up to 28% of healthy children.<sup>6</sup> In contrast, the incidence of superficial white onychomycosis in healthy adults is approximately 5%, with higher rates in the HIV-infected population.<sup>9</sup>

Patients with onychomycosis will often have associated conditions that the clinician should consider. Psoriasis is known to confer an increased risk of developing onychomycosis in adults and children.<sup>10</sup> More specific to the adult population, those with diabetes, peripheral vascular disease, and hypertension are considered to be at greater risk of acquiring onychomycosis, whereas in children the most common associations are atopic dermatitis and tinea pedis.

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**Fig. 1** A 19-year-old African-American woman with a single darkly pigmented band on the fingernail. Biopsy revealed melanoma *in situ*.

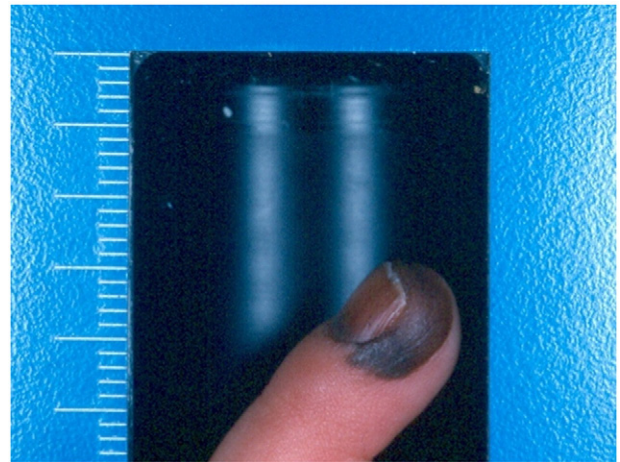
The differential diagnosis of onychomycosis partially overlaps both populations. In each group, psoriasis and trauma represent common alternative diagnoses; however, in adults, neoplasms must be considered (particularly when a single digit is involved), whereas in children, congenital disorders such as subungual exostosis and congenital malalignment of the great toenails are a consideration.<sup>11</sup>

In regard to treatment, oral terbinafine is considered the drug of choice for onychomycosis in adults with the highest cure rate (approximately 75%) and lowest relapse rates (approximately 33%). Alternatives include oral itraconazole, fluconazole, and griseofulvin, which have lower cure rates and higher risk of recurrence.

In the pediatric population, there is no formal consensus on treatment, nor is there a systemic antifungal approved by the



**Fig 2** A 4-month-old African-American boy with a single darkly pigmented band on the fingernail. Biopsy was consistent with a nevus.



**Fig. 3** A 4-year-old Turkish girl with a diffuse brown pigmentation of the nail plate extending onto the dorsal finger. Biopsy revealed a nevus with atypical features.

Food and Drug Administration for the treatment of onychomycosis in children. Both terbinafine and itraconazole are well studied in children, with high cure rates of approximately 80% with both drugs.<sup>12</sup> Of note, the higher cure rates attributed to itraconazole in children, compared with adults, may be due to the greater incidence of candidal onychomycosis in the pediatric population. This is particularly true in fingernail onychomycosis in children, which is more likely to be candidal in origin. Despite the efficacy of systemic antifungals, it has been suggested that very young children and those with mild nail involvement be treated with a course of topical antifungals initially, in an attempt to limit the use of systemic medications in the pediatric population. This treatment strategy may be more effective than in adults, as nails grow faster in children and may be more amenable to topical therapies, although cure rates of topical therapy in children have not been established.

Although regarded as generally safe and well-tolerated medications, laboratory evaluation, particularly liver function tests and complete blood cell counts, are commonly monitored in adults on terbinafine and itraconazole. In children, laboratory monitoring is often, but not universally, performed. A recent meta-analysis found the rate of laboratory abnormalities in children taking systemic antifungals to be <2%.<sup>12</sup> The incidence of adverse effects in adults is similarly low, with one review noting a risk of acute liver injury of 2.5 per 100,000 persons on terbinafine and 10.4 per 100,000 in those on itraconazole. Neutropenia and thrombocytopenia were reported in rare instances only.<sup>13</sup>

### How is the approach to evaluating melanonychia striata different in children and adults?

Melanonychia striata poses a diagnostic and therapeutic challenge in both adults and children. The characteristics of melanonychia vary greatly between the adult and pediatric

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