Treatment of *Pseudomonas* Nail Infections with 0.1% Octenidine Dihydrochloride Solution

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*Pseudomonas* nail infection is a distressing and frustrating problem due to the unpleasant green discoloration of the nail. Its clinical presentation consists of greenish or bluish-black discoloration associated with proximal chronic paronychia and distolateral onycholysis [1]. Predisposing factors are exposure to a moist environment, microtraumatisms, onychotillomania and associated nail disorders such as psoriasis [1]. Although *Pseudomonas* nail infection is common, there are no controlled studies assessing systemic or topical treatments.

We present a small series of 15 patients (table 1), 4 males (age: 46–72 years, mean: 57.75) and 11 females (age: 39–73 years, mean: 57.72) with *Pseudomonas* nail infection (fig. 1). Fungal infection was excluded by microscopy and culture of nail scrapings. All patients had positive isolation by microscopy and culture of *Pseudomonas* from the deep section of the nail. All patients were treated topically by soaking the affected nails twice a day for 10 min in 0.1% octenidine dihydrochloride solution (Sol Octenisept 250 ml, Schuelke & Mayr, Norderstedt, Germany) for 6 weeks.

The beginning of the treatment was preceded by a 30-day washout period in subjects using topical or systemic antimicrobials. The patients were evaluated after 6 weeks of application of 0.1% octenidine dihydrochloride solution with microscopy and culture. Patients having both negative microscopy and culture results were considered as cured regardless of nail coloring, since the nail hue has been suggested to result from diffusion of pyocyanin rather than the true invasion of *Pseudomonas* in nail plate [1].

Ten patients reported that their hands were frequently immersed in water; the other 4 had diabetes or another nail disease and only 1 patient (No. 3) presented the *Pseudomonas* nail infection without any predisposing factors. At the end of the 6th week of application of 0.1% octenidine dihydrochloride solution, 12 of 15 patients (80%) had complete clearance of their affected nails (fig. 2). Three female patients (No. 2, 11 and 14) failed to respond, probably due to their occupations. No adverse effects were noticed during the application period.

*Pseudomonas* are gram-negative waterborne rod bacteria. The pathogenesis of nail infection by *Pseudomonas* remains obscure. It is considered to be a complication of onycholysis of various origin or chronic paronychia [2], and this is confirmed in our series (table 1). It also seems that a paronychial infection with *Pseudomonas* is usually preceded by onycholysis or paronychia, leading to pyocyanin pigment staining of the adjacent nail [1]. The disease commonly is restricted to 1 or 2 nails.

*Pseudomonas* is usually isolated on cultures of specimens taken from the paronychia. Topical treatment includes removal of the onycholytic portion of the nail and avoidance of wetness [3], brushing of the nail bed with a 2% sodium hypochlorite solution twice daily [1], application of diluted acetic acid or polymyxin B 2 and vinegar soaks (10-parts water and 1-part white vinegar) for 5–10 min twice daily for 5 days [4].

Octenidine dihydrochloride is a well-known topical antibacterial agent active. Octenidine has been shown to possess microbicidal activity against *Staphylococcus aureus*, *Staphylococcus epi-
dermidis, Proteus mirabilis, Streptococcus pyogenes, Klebsiella pneumoniae, Escherichia coli, Pseudomonas aeruginosa, Serratia marcescens and Candida albicans [5]. Octenidine displays low absorption and toxicity [6]. In addition, it is well tolerated by patients [7]. Other studies have also suggested that octenidine has a residual effect on microbial skin decontamination [8]. To our knowledge, this is the first study evaluating the treatment of Pseudomonas nail infection with this medication.

Based on our small series, 0.1% octenidine dihydrochloride solution seems to represent an interesting, well-tolerated, safe and efficacious therapeutic choice for the treatment of Pseudomonas nail infection.

References