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Pachyonychia congenita
(Jadassohn-Lewandowsky Syndrome)

A Review of 14 Cases in Slovenia

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Abstract. Pachyonychia congenita (Jadassohn-Lewandowsky syndrome) was studied in the population of Slovenia. Altogether 14 cases were detected; 11 were studied personally by the authors while 3 were ascertained from patients' histories. The patients belonged to 5 families. The incidence of this condition in the Slovenian Population is 0.7 case per 100,000 inhabitants.

Pachyonychia congenita (Jadassohn-Lewandowsky syndrome; JLS) was first described in 1906 by Jadassohn and Lewandowsky [1]. There is still some controversy about the concept of the disease and the terminology. Siemens [2] considered JLS as a keratosis multiforis, Touraine [3] labelled it as a polykeratosis, Jannasch and Wismann [4] proposed the term 'dyskeratosis multiformis idiopathica', whereas Korting [5] also accepts the term polykeratosis. In the ophthalmologic literature, it is also known as Schäfer's syndrome [6]. At present, many authors share the views of Kuner and Loos [7], namely that JLS appears in one of the following three clinical forms: (1) pachyonychia, palmoplantar keratoderma, follicular hyperkeratosis, (2) pachyonychia, palmoplantar keratoderma, follicular hyperkeratosis, leukokeratosis of the tongue and buccal mucosa, and (3) the third form includes the same symptoms as quoted under 2 as well as corneal dyskeratosis or cataract [8]. A number of authors described further anomalies as blisters and changes in pigmentation [3], hypotrichosis and other hair growth deficiencies [9], dental disorders [10, 11], mental retardation [12, 13] and others. According to
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Moldenauer and Ernst [10], pachyonychia is an almost constant symptom, leukokeratosis a very frequent one (in 87% palmoplantar keratoderma may be missing, 13).

It is generally assumed that the disease is inherited by one autosomal-dominant gene [14], while Cosman et al. [15] as well as Cockayne [16] consider that this condition is determined by two autosomal-dominant genes. Usually, more than one case is observed in one family; Kumer and Loos [7] were able to follow the transmission through 5 generations; sometimes, however, only sporadic cases are detected. JLS has been reported relatively frequently: Moldenauer and Ernst [10] analyzed 93 published cases, Kumer and Loos [7] described an additional 23 cases. Taking into account the 3 cases published by Moldenauer and Ernst [10], 1 case published by Gardina and Guarneri [17] 3 by Torstind et al. [18], 2 by Sivurova et al. [19], 3 by Ammeroth et al. [20] and 9 cases by further authors, the total number of JLS patients reliably described in the literature would amount to 135. It is, however, difficult to assess the exact number as some cases were described under other diagnoses, for example epidermolysis bullosa simplex, as was stated by Schzyrder and Kunkler [21]. Except for the report on JLS in Slovenia published by Kavic and Kanzsky [22] in 1978, no population studies are available on the incidence of JLS.

The present study is concerned with JLS causes detected in the population of Slovenia.

Methods

The study of JLS cases was started by a number of dermatologists who were interested in palmoplantar keratoderma in Slovenia. Some helpful data on JLS were found by studying the clinical records at the Departments of Dermatology in Ljubljana, Maribor, Novo Mesto and Celje. The fact that the population of Slovenia totals only 1.86 million inhabitants makes the population genetic studies easier. Slovenia is in the north-west of Yugoslavia and enjoys a good medical service which has also contributed to the success of the present study. A number of dermatologists were helpful and the authors appreciate their contributions.

Case Report

Altogether 14 patients with JLS, who belonged to 5 families, were detected. The names of the families are coded with the letters A, M, O, L and MR. Their genealogical trees are shown in figure 1.
Family A

2 members are affected with JLS: I/6 and II/1; II/4 has a congenital luxation of the hips.

Patient A-I/6 has a palmoplantar keratoderma, all nails are thickened and some have the form of claws. Follicular hyperkeratosis of the lateral sites of the extremities and the body was apparent.

A-II/1. At the age of 1 year blisters appeared on the soles and in between the toes; they disappeared at the age of 3. Approximately at the same time, the toe-nails became thickened; similar changes of the finger-nails soon followed. Follicular hyperkeratosis developed on the extensor sites of the extremities. Later on, thick hyperkeratoses appeared on the palm and soles; if the soles were exposed to pressure, pain was experienced by the patient so that he could barely walk; atrophy of the leg musculature resulted. Stat. dermatol. in 1979; there was a thick plantar keratoderma with deep rhagades (fig. 2). The toe-nails were thickened and of a yellow-grayish color; the muscles of the lower extremities showed signs of atrophy.

Family M

4 members' histories had all the typ...
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Fig. 2. Hyperkeratosis of the soles. Patient A-II/1.

...signs of atrophy. There were deep palmar hyperkeratoses, the tenar and the volar sites of the metacarpophalangeal joints being predominantly involved. All the finger-nails were also thickened; at the free edge they measured approximately 5–6 mm (fig. 3). At the backs of the hands, on the elbows and on the knees there were verruciform hyperkeratoses. On the extensor sites of the extremities, follicular hyperkeratotic papules were present. The tongue was covered with a grayish layer and similar, less well expressed changes were seen on the buccal mucosa (fig. 4).

Family M
4 manifest cases and 1 latent case have been observed in this family. From the patients' histories it is possible to conclude that the family member M-I/1 who was dead, had all the typical signs of JLS.
Patient M-I/3 has a follicular hyperkeratosis on the extensor sites of the extremities and small hyperkeratotic areas on the palms, and, to a lesser extent, also on the soles.

Patients M-II/2 and M-II/3 have a pachyonychia of the toes, verruciform hyperkeratoses on the back of their hands and fingers, a follicular hyperkeratosis on the extensor sites of the extremities and a well-expressed palmar and plantar hyperkeratosis. In his childhood patient M-II/3 had recurrent eruptions of blisters on his elbows, knees and legs; 2 incisor teeth did not appear (hypodontia).

Patient M-II/4 has a pachyonychia on her fingers and toes and a follicular hyperkeratosis on her forehead and nose.

**Family O**

3 manifest cases and 1 latent case could be detected in this family; the changes could be followed through 3 generations.

Patient O-I/1 was affected only with palmo-plantar keratoderma as was reported by patient M-I/3.

Patient O-II/6, O-II/4 and O-III/5 have all the typical signs of JLS: a pachyonychia of all nails, a plaque-like palmar and plantar hyperkeratosis, a follicular hyperkeratosis of the extensor sites of their upper arms and forearms; a leukokeratosis of the tongue and buccal mucosa is also expressed. Patient O-II/6 has additionally paronychia-like inflammatory changes around the nails (fig. 5) and severe periodontosis. Patient O-III/5 has a hoarse voice; grayish membranes were detected by laryngoscopy on her vocal cords.

**Family L**

In this family only 1 female patient was detected. As a careful history did not reveal any further affected members, it has to be assumed that this is a sporadic case. She has all
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Fig. 4. The dorsal site of the tongue is covered with a grayish hyperkeratotic layer. Patient A-II/1.

Fig. 5. Thickened finger-nails. Patient O-II/6.
the typical signs of JLS: a plaque-form palmoplantar hyperkeratosis; all her finger-nails and toe-nails are characteristically thickened and of a brownish color; some nails have the form of claws. A follicular hyperkeratosis is expressed on the lateral parts of the body and on the extensor sites of the extremities. The buccal mucosa clearly shows a leukokeratosis. She also has a Gothic palate and degenerative changes of her eye fundi.

The hyperkeratotic changes on her palms and soles appeared in her early childhood; at a certain period blisters used to appear on her feet so that she had difficulties in walking. At 6 years of age, paronychia-like inflammatory processes affected her fingers, which resulted in the loss of all her nails. The new nails were typical for JLS. At the age of 21, her nails were removed and the nail-beds treated by X-rays without a result.

Family MR
From the history given by patient MR-II/1, it was concluded that his grandfather (MR-I/1) had palmoplantar keratoderma. The patient’s father presumably is symptom-free. The patient has claimed that the thickened nails were observed for the first time at the age of 15 years. He was seen at the age of 17 years and did not show up for a reexamination, when invited. Patient MR-III/1 has a typical pachyonychia of all his finger-nails and toe-nails. He also has a diffuse hyperkeratosis on his palms and volar sites of his fingers. He also has hyperkeratotic changes on the proximal and distant parts of his soles.
<table>
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<th>Palmoplantar keratoderma</th>
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<th>Blister</th>
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Discussion

In the present investigation, 14 patients belonging to 5 families were detected: 11 were studied by the authors while 3 cases were ascertained through histories. The male to female ratio was 9:5 which is in good agreement with the ratio of 71:41 given by Moldenauer and Ernst [10] and 100:41 by Tourette as quoted by Schnyder and Klinker [21].

A short review of the symptoms of the 11 patients studied personally is given in table I. Thickened nails have been observed in 10 of them; the only one who did not exhibit nail changes was the mother of 3 patients M-I-3. Palmoplantar keratoderma was present in 10 patients in most of whom it appeared in the form of insular hyperkeratoses, while A-II-I had a very severe diffuse form, which regressed partially after the X-ray treatment. Follicular hyperkeratosis was established in 10 patients, leukokeratosis in 5, blisters occurred at a certain stage of the disease in 5 cases. Dental anomalies were seen in 5 patients: missing incisors in 1, amelogenesis imperfecta in 2, periodontosis in 1 and an unusually progressing caries in 1. The palmoplantar hyperhidrosis was expressed in 6 cases. In 1 case, mental retardation is assumed (a 3-year-old child). The thickened nails were either present at birth or they appeared soon afterwards. Patient MR-III-I claimed that the diffuse palmoplantar keratoderma on his hands appeared at the age of 15, a similar observation has been reported in the literature [10].

In almost all our patients, the first diagnosis was candidiasis, so we believe that this diagnosis should be put on the first place when considering a differential diagnosis. Further diseases which could cause diagnostic difficulties are epidermolysis hereditaria bullosa simplex, Acrodermatitis enteropathica bullosa as well as the Zinzer-Engman-Cole syndrome (pigmellatio reticularis, onychodystrophy, leukokeratosis and dysplasia of the teeth).

The present investigation shows an incidence of approximately 0.7 JLS case per 100,000 inhabitants of Slovenia, which is rather high. The geographical distribution of our cases reveals that the great majority (12 cases) live and originate from a rather small area in the vicinity of Ljubljana; only one patient, the sporadic case (family L), is from a relatively distant part of Slovenia (fig. 6). Although up to now no kinship between the families involved could be established, the geographical distribution (one geographical nucleus) would favor the hypothesis that all of our patients might have a common ancestor; this hypothesis remains, however, to be proved. Anyway, the observation that almost all patients with JLS belong to one geographical nucleus is in contrast to the observations made in our studies on the Unma-

References

3. Tourette, de la Peau et des Cheveux, 481 (1926).
12. Tourette, de la Peau et des Cheveux, 481 (1926).
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Thost and Papillon-Lefèvre types, where several geographical nuclei where established. The acceptance of the theory of one ancestor would speak in favor of a rare genetic mutation causing JLS.

According to the classification of Kummer and Loos [7], none of our patients can be included into the third category as none has corneal manifestations. Most of our patients belong to the second category (A-I/I, A-II/1, O-I/6, O-II/4, O-III/5, L) while the rest belongs into the first category. The data collected during the present study support the idea that JLS is inherited by an autosomal dominant gene. This genetical situation was clearly observed in families A, M, O and most probably also in MR.

References

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