Clinical study

PAPILLON-LEFEVRE SYNDROME (PLS)

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ABSTRACT

Background. The syndrome was first described by Papillon and Lefevre in 1924, it is characterized by palmoplantar hyperkeratosis and severe periodontal breakdown, resulting in early loss of teeth.

Objective. The authors were engaged in obtaining data on Papillon-Lefevre cases in the population of Slovenia.

Methods. Clinical records were studied and patients' families were investigated at their homes. Among the 2 million Slovenian population 13 persons were detected in 7 families. Consanguinity could not be proven. 11 affected persons were monitored by the investigators.

Results. The patients who cooperated in the study, showed in most cases psoriasis-like skin lesion and palmoplantar hyperkeratosis. A severe periodontitis appeared soon after the teeth eruption. Some of them were treated with antibiotics and retinoids, nonetheless they lost all the teeth up to the end of puberty.

Conclusion. The genetic defect remains unknown, The therapy is symptomatic: antibiotics and good dental cleaning are important. Retinoids influence primarily the skin lesions. Cooperation between dermatologist and stomatologist is needed and an early treatment is indicated.

KEY WORDS

Papillon-Lefevre syndrome, hereditary hyperkeratosis with periodontosis, patients, Slovenia

INTRODUCTION

The combination of a transgredient palmoplantar hyperkeratosis which is usually mild with a severe periodontal breakdown, resulting in early loss of both, the deciduous and permanent teeth was first described by Papillon and Lefevre in 1924 (1). Until now about 200 cases of the Papillon-Lefevre syndrome (PLS) have been described. During the 1994-95 period, 17 cases were reported (2,3,4,5,6,7,8). However, exact numbers cannot be given while some cases are mentioned two times or more, and certain cases are not reported. Though most case reports deal with Caucasians there are also PLS reports from Mongoloid and Negroid races. It is interesting to note that in Slovenia with its 2 million inhabitants 11 PLS patients were diagnosed (9). The syndrome may be supposed to be more frequent than believed, since dentists may overlook the mild palmar and plantar hyperkeratosis and dermatologists may not

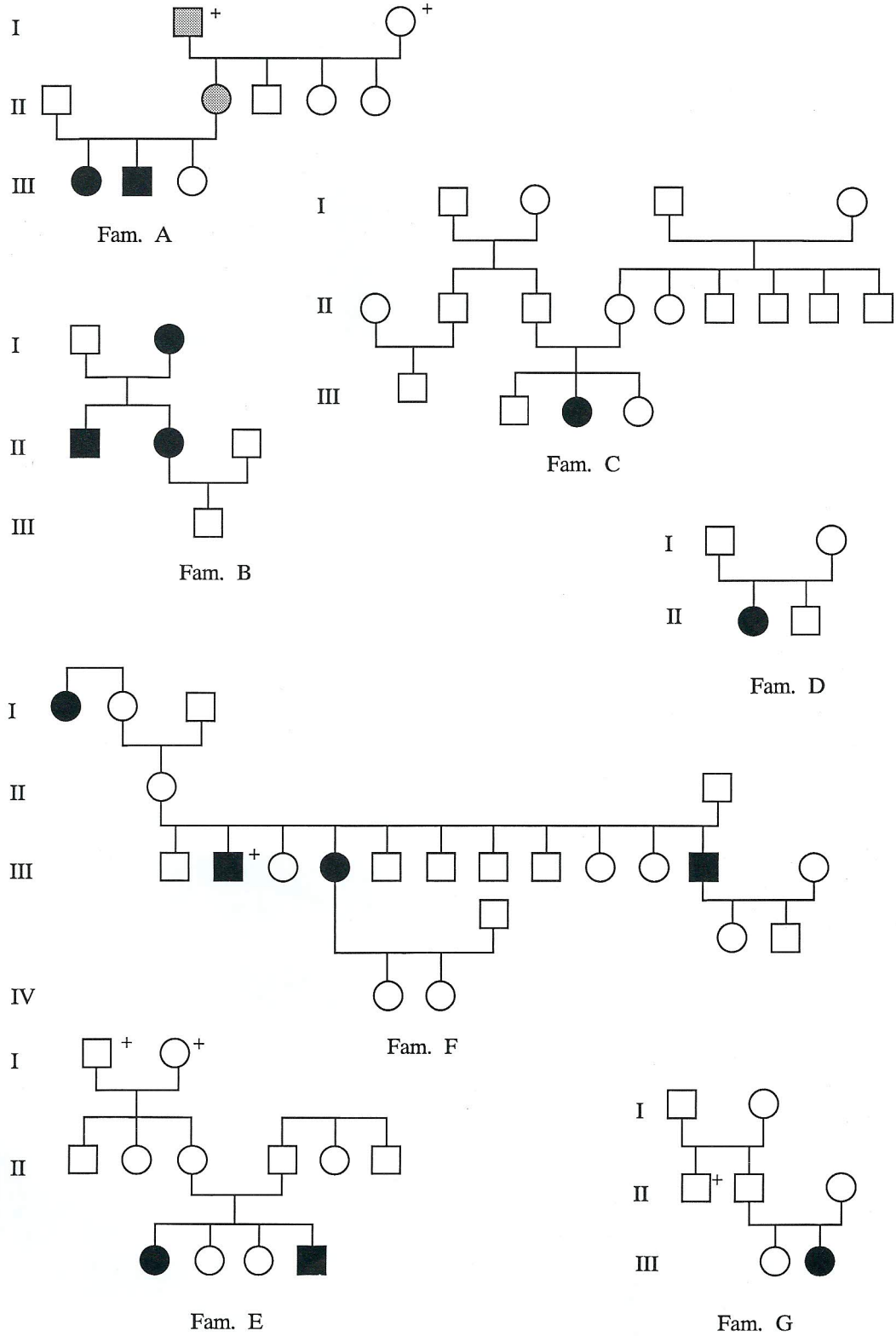

Fig. 1. Pedigrees of 7 families in Slovenia in which 13 patients affected with Papillon-Lefevre syndrome are presented

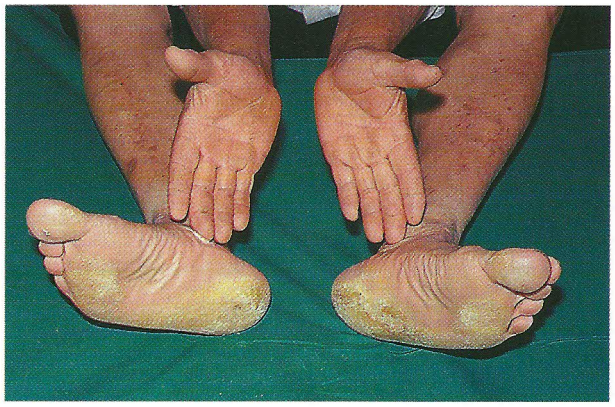

Fig. 2. The 17-year-old patient K.B. (family G). Reddened and mildly hyperkeratotic palms, hyperkeratosis is particularly expressed on her soles.

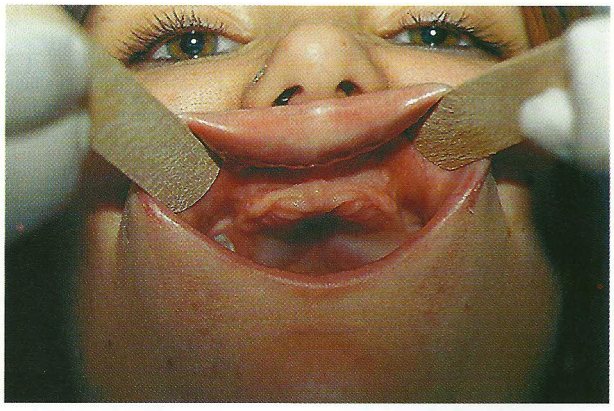

Fig. 3. The patient is toothless, her alveolar ridge atrophic.

be aware of the unique loss of teeth. An autosomal recessive inheritance is assumed. The genetic defect remains unknown.

CLINICAL SYMPTOMS

Specific criteria for diagnosing PLS are:

1. periodontitis and alveolar pyorrhoea
2. premature loss of all deciduous and permanent teeth
3. palmar and plantar hyperkeratosis
4. sharply delineated psoriasis-like skin lesions on other parts of the body
5. autosomal recessive inheritance
6. facultative symptoms are increased susceptibility to infections and asymptomatic intracranial calcifications (10).

The most consistent symptom is the characteristic loss of all teeth. After the normally shaped deciduous teeth erupt, a severe inflammation of the gingiva appears, with periodontitis and pocket formation leading to a complete loss of teeth by the age of 4 to 5 years. The permanent teeth appear at normal time and are as a rule lost in the same way. The periodontal breakdown is usually a consequence of an inflammatory destruction (periodontitis) while a

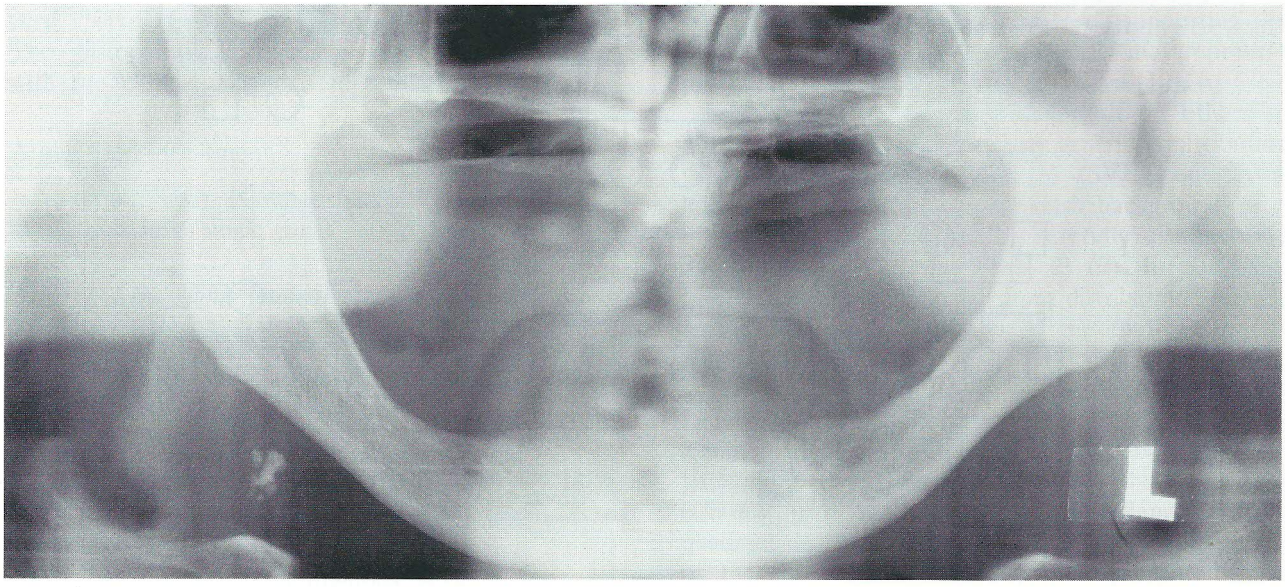

Fig. 4. Panoramic x-ray of the patient K.B. at the age of 17 years. She is edentulous, her alveolar ridges are markedly atrophic.

poor oral hygiene and the subsequent accumulation of dental bacterial plaque are contributing factors. Periodontal breakdown in a child or adolescent can be slowned down by maintaining good oral hygiene. The exact mechanisms causing this condition are not known, it seems however that an inborn deficiency of the immune system is an important factor (11).

Cutaneous symptoms are characterized by palmar and plantar hyperkeratosis, which is normally accompanied by a moderate hyperhidrosis. Hyperkeratosis often extends to dorsal aspects of the hands and feet (transgression) as well as to the region of the Achilles tendon. Additionally sharply delineated psoriasis-like plaques may be present on elbows, knees, dorsal aspects of the metacarpophalangeal joints, but also elsewhere (12). The red colored plaques are covered by a hyperkeratotic stratum corneum or parakeratotic scales. The hair and nails are usually normal, but sparse hair was noted (13).

X-rays of the maxilla and the mandible show severe atrophy of the alveolar bone. The main reason is the early loss of teeth, which prevents normal jaw development. Further reason for atrophy are inflammation that incites osteolytic processes in the bone and the use of dentures.

Laboratory tests show decreased neutrophil phagocytosis (14). Impaired reactivity to T- and B- cell mitogens (15) with only minimal changes in monocyte function (16) might account for prominent gingival and cutaneous infections. Non-infective mechanisms of disruption of gingival fibroblast and cementoblast function have also been considered (17).

Microbiological findings show a close association between Actinobacillus (A) actinomycetemcomitans and the periodontal disease associated with the syndrome. A actinomycetemcomitans by itself is not sufficient for the expression of periodontal disease. Other factors, some of which must be genetic, are necessary for lesion development (18). Histopathological changes are non-specific but show hyperkeratosis with irregular parakeratosis and a moderate perivascular infiltrate. Electron microscopic findings of skin lesions include lipid-like vacuoles in the corneocytes and granulocytes, reduction in tonofillaments and irregular keratohyalin granules. These changes improve during retinoid therapy (19).

TREATMENT:

Dental cleaning and antibiotics are still the standard therapy. Etretinate (20), isotretinion (21) and acitretin (19) have all been successful in improving the cutaneous lesion, lessening gingival inflammation and in several cases, saving the teeth. Recently proposed treatment involving antibiotic coverage (amoxicillin plus clavulanic acid, or ofloxacin), extraction of primary dentition and a period of edentulism has been shown to be effective in maintaining the permanent dentition (22,23). Since treatment should begin prior to eruption of the permanent dentition, early recognition of PLS is critical. Any young patient who exhibits palmar hyperkeratosis should be examined carefully for periodontal breakdown.

PLS CASES IN SLOVENIA

In Slovenia (about 2 million inhabitants) we found 13 cases in 7 PLS families (24, 25), which is a much higher rate as reported in the literature (1-3 cases per million). No relationship among the families could be established. All patients except one are from Eastern Slovenia. Except for dental and skin problems patients are well, two involved members of family F are deceased. Five of our patients are males and eight are females.

Family A: A brother born in 1959 and a sister born in 1958 are affected. The mother has discrete plantar and palmar hyperkeratosis her father had the same changes. The two patients lost their permanent teeth by the age of 15-16 years.

Family B: A brother born in 1954 and a sister in 1955 have PLS. The skin symptoms were diagnosed at the age of 8 months. They lost all of their permanent teeth at 12 years. The sister is married, she has a child who seems to be free of the disease.

Family C: A female born in 1968 is affected, changes on the skin appeared at the age of three years, she lost her deciduous and permanent teeth in a typical way. Her mother has mild hyperkeratosis and hyperhydrosis on palms.

Family D: The mother has palmoplaptar hyperkeratosis. 2 children have PLS, but they failed to complete the study.

Family E: 2 cases of PLS. In the male patient born in 1964 first changes on the skin appeared within the 3rd year of life, he lost his deciduous teeth with 4 years, and he started to loose his permanent teeth from the 9th year on. The sister born in 1957 had a similar medical history. She has a child who is without symptoms.

Family F: Grandmother´s sister and 3 grandchildren were affected, the grandmother´s sister and one brother died.

Family G: One female person born in 1979 is affected. She was treated with retinoids in her youth, nevertheless she lost her permanent teeth at the age of twelve years.

At the age of 17 years the skin on her elbows was reddened and slightly infiltrated, similar lesions were expressed at the dorsal aspect of interphalangeal joints as well as around the nails. The palms were reddened and mildly hyperkeratotic, while a severe hyperkeratosis was expressed on her soles (Fig. 2). She was completely toothless (Fig. 3). The panoramic x-ray confirmed that she was toothless and additionally displayed a marked resorption of the alveolar ridges.

CONCLUSION

The Papillon-Lefevre syndrome is a nosologic entity inside the broad family of palmoplantar keratodermas. The skin lesions are annoying, the severe periodontitis and the complete loss of teeth by the end of puberty represent an even more serious problem to the patient. The genetic defect is not known, so the treatment is mostly symptomatic. Meticulous oral and dental hygiene is of primary importance

The incidence of 6.5 cases per million in the Slovenian population is substantially superior to that of 1-3 per million, which is mentioned in the literature.

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