

PIEZOGENIC PEDAL NODULES OF YOUNG CHILDREN AND THEIR PARENTS

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Abstract

Skin of athletes is open to constant effect of disadvantageous outward factors, which could be reason of illnesses in this area. Very often incidence disease is Piezogenic Foot Nodules (PN). These papules represent herniations of subcutaneous fat through the collagen matrix of the reticular dermis. Suggests that as many as 10% to 20% of the population may be affected with both symptomatic and asymptomatic lesions. Painful piezogenic papules are reported more frequently in women than in men. Among athletes they appear mainly at the marathon runners and volleyball players. Trauma may also initiate the formation of pedal papules. These are soft, skin colored, typically asymptomatic, medial heel papules and nodules, appear on the side of the heel, usually the medial aspect, when the subject is standing and disappear when weight is taken off the foot. Papules may be painful when there is herniation of fat into the dermis with a resultant reduction in dermal thickness. They could concern one or both feet. Usually there are plural changes. There is no satisfactory medical or surgical treatment.

Aim: The aim of work is presentation family occurrence of PN.

Material and methods: Research concerned 50 children (girls and boys) in age about 5,5 years.

Results: Incidence of PN observed at 16 % children and 22.06% in check up group (5 children). In children and parents group 100% changes concerned heels. Pain reported only 4 parents (5,88%).

Conclusions: Appearance skin changes during fat load on Piezogenic Nodules is connected with doing more activity. Painful papules can limit participation in sports and may affect occupational activity.

Key words: skin diseases; children; foot

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Introduction

Skin plays many functions that are important for human organism. It takes part in its defense mechanisms. When it comes to dermatoses, in certain cases skin is the only organ involved - in others skin changes are one of many symptoms preceding or accompanying various entities and illness syndromes. Sometimes, due to characteristic features, skin changes can be a clue facilitating correct diagnosis. Cutaneous eruptions, both on child's skin and on adult man's skin, can often be a significant track leading to the origin of a disease.

Changes on the skin can be restricted and therefore characteristic for specific localization, e.g. foot - the most peripheral part of a lower limb in human anatomy. Its structure is characteristic only for human being due to his vertical posture. Foot skin injuries are often observed in groups of physically active people. Therefore, the sportsmen

are more affected by them than any other working group. What is more, certain entities are specific only for particular sport disciplines [1-3].

Piezogenic Pedal Nodules (PPN) - cutaneous herniae described in 1968 by Shelley and Rawnsley are not such uncommon entities [4]. Changes are manifested as nodules or papules and localized most often along the sole of the feet. They are flesh-colored or yellowish. Their size oscillates between 0,5 and 1,5 cm. Other less frequent localizations are: wrists or thenar.

PN occurs very often. We can distinguish two forms:

- 1) asymptomatic, observed in 10-20% of population [2]
 - 2) painful one, observed mainly among the sportsmen or patients with diagnosed connective tissue diseases [5].
- Having painful forms of PPN is also characteristic for the people with the injuries of the foot area. PN appear when a patient is in a vertical position.

They disappear once he or she is in horizontal one. Moreover, patients can very often feel pain during standing or walking [2]. Changes may affect one or both feet. Nevertheless, the appearance on both sides is more frequent [6].

Usually changes are multiple. Singh et al observed a 22-year old man with 22 nodules and pustules on one foot and 17 on the other [7].

The main cause of PN changes is penetrating epidermis propria by subcutaneous fatty tissue on feet edges during the moment of increased weight [6,8]. Cutaneous herniae created in that way are related to resistance or genetic reduction of the number of septa in fatty tissue.

PPN – like changes can occur at any age.

In differential diagnosis lipomas, connective tissue mole/stigma or neurofibroma are considered.

The most affected group of people consists of sportsmen, esp. athletes.

The aim of this work was to present the appearance of PPN on feet in the family.

Material and Methods

The research involved 50 children, girls and boys of 1-10 years (average: 5,5 years old) and their parents-68 people, men and women aged from 25 to 46 years (average age: 35,5). All of the parents, currently or in the past were members of sport clubs: 15 people played basketball, 29-volleyball, 18-football and 6 were athletes.



Figure 1. Piezogenic Pedal Nodules in children

Discussion

PN are observed in 10-20% of the society [2]. In the population of our research (126 people) PPN were diagnosed in 23 cases (18,25%).

PN can appear at any age. Greenberg and Krafchik noted incidence of PPN in 5,9% of examined newborns and in 39,45% infants from Canada [9]. Lorralde de Luna et al described 4 PPN cases among newborns from Argentina [10].

There is significant correlation between PPN and physical activity: PPN is often described in the group of people taking up different sport disciplines. This is the factor that can trigger changes among people of genetic predisposition (reduction of the number of septa in fatty tissue or their resistance) [11]. In our group this correlation reached 22,06%. Intensiveness of pain can differ. Laing in his group described pain symptoms in 86% cases of herniae [12]. In the male group analyzed by

The diagnosis was made on the basis of characteristic clinical symptoms. An interview regarding the incidence of connective tissue diseases as well as feet injuries in the past of the family or the interviewee was held.

Results

PN appeared in the group of 8 children (16%) (Fig. 1), (aged 4-10 years old): 25% were boys, 75%-girls. In the group of adults PPN was diagnosed in 15 cases (22,06%) (Fig. 2): 10-female (66,67%), 5-male (33,34%). None of the children complained about pain, whereas in the adult group 4 people (5,88%) suffered from pain.

The interview regarding past feet injuries was positive among 2 children with PPN. Other 2 children have positive interview related to connective tissue diseases (one of these children's parents suffered from Morphea, the second from RZS).

In the group of children with PPN the following changes were observed:

- 1 child (12,5%) - only one foot affected,
- The rest of children (87,5%) - changes appeared on both feet.

The changes were localized on children's heels.

Among adults proportions were almost identical:

- whole skin changes were linked to heel localization,
- in 80% of cases changes appeared on one foot,
- in 20% of cases on both feet.



Figure 2. Piezogenic Pedal Nodules in an adult

us pain appeared in 5,88%. Pain accompanies PPN in cases of connective tissue disease or past feet injuries.

Doukas believed that the major causative factor of PPN is either positive feet injury history or genetically inhabited connective tissue diseases [13]. Kahana et al described PPN incidence among more than 34,5% patients with Ehlers-Danlos Syndrome [5]. Family incidence of PPN was also described [14].

In our research familial occurrence was expressed in 8 cases, in 4 cases changes correlated with injuries and connective tissue diseases.

Treating in case of asymptomatic changes is not needed. In other cases painful nodules and papules can be excised surgically [15]. It is recommended to reduce body weight (especially for overweight people) and to avoid long staying in standing positions [2].

Doukas et al suggested non-surgical approach towards treatment. They injected betametasone and bupivacaine in equal parts (1-2ml/injection), in 3 doses, in 1-3-5 –month intervals. The last 3rd injection resulted in pain vanishing. Moreover, they also tried using electroacupuncture [16]. Pontious et al used special orthopedic coverings for heels in cases characterized by intense pain [17].

Conclusions

The appearance of changes in the course of PPN is significantly related to the intensiveness of physical activity. Training is a factor that can trigger changes in people with genetic predisposition. There is a possibility of the incidence of PPN among family, especially if one of the parents was physically active and trained a lot in the past.

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