

CLINICAL FEATURES OF VITILIGO IN CHILDREN AND ADOLESCENTS

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Objective - The research was implemented in order to determine the epidemiological and clinical characteristics of vitiligo in children and adolescents.

Material and methods - The study was conducted as a cross-sectional study of patients aged 0 to 18 years, treated at the Department of Dermatology at the Institute for Children and Youth Health Care of Vojvodina in Novi Sad, from January 1996 to January 2009. The study included 75 children and adolescents with vitiligo, 47 girls and 28 boys.

Results - The average age of the patients was 10.81 ± 4.06 years, and their age at the time of occurrence of vitiligo was 8.46 ± 4.19 years. The most common "trigger" for the occurrence of vitiligo was stress in 18 (13.5%) children. 19 (25.3%) had a positive family history of vitiligo, and 29 (38.6%) patients for other endocrine and/or autoimmune diseases, mostly for thyroid disorders - in 25 (33.3%) patients. The initial vitiligo lesions were most often on the head and neck - in 33 children (44.0%). Non segmental vitiligo was diagnosed in 69 (92.0%), and segmental vitiligo in 6 children and adolescents (8.0%). The most common type of vitiligo was generalized, in 32 (42.7%) patients. 28 (34.1%) had polyosis, 35 (42.7%) halo nevus, and Koebner's phenomenon was found in 19 (23.2%) children and adolescents with vitiligo.

Conclusion - A higher incidence of vitiligo was confirmed in girls, the most common type of vitiligo was generalized, the most common sites of the initial lesions were the head and neck, which is consistent with previous studies on children's vitiligo. The lower frequency of segmental and a higher incidence of acrofacial vitiligo is probably linked to the fact that 42.7% of the sample consisted of adolescents.

Key words: Vitiligo ▪ Child ▪ Adolescent

Introduction

Vitiligo is an acquired disease of the skin and mucous membranes, most likely of autoimmune nature, sometimes with a clear hereditary component, which is characterized by progressive, clearly defined, milky white spots on the skin and/or mucous membranes (1). It appears primarily in young adults, and in half of the patients vitiligo occurs before they reach 20 years of age (1, 2). The characteristics of vitiligo in children have been described in only a few studies in the world (3, 4, 5, 6). Unlike in adults, where the frequency of vitiligo is about the same in both sexes, vitiligo in children is more common in girls (3, 4, 6). In the family history of affected children, vitiligo is present in from 11% to 35%, while in affected adults it is positive for about 8% (2, 3, 4, 5, 6). The prevalence of segmental vitiligo in children was about 20%, with only 5% in adults (2, 4, 6). The research was implemented to determine the epidemiological and clinical characteristics of vitiligo in children and adolescents.

Materials and methods

Subjects

The subjects included in this study were patients with vitiligo diagnosed at the Department of Dermatology of the Institute for Children and Youth Health Care of Vojvodina in Novi Sad. The introduction of subjects to the study was successive and in order of arrival for check up during the period from January 1996 until January 2009.

Methods

The investigation was conducted as a cross sectional study. Data were collected from medical records using a prepared questionnaire: the date of birth and sex of the subjects, age at the time of occurrence of vitiligo, information about provoking factors (stress, sunbathing, skin diseases) that preceded the

development of vitiligo, the presence of endocrine and/or autoimmune diseases before and after the onset of vitiligo, the existence of vitiligo and endocrine and/or autoimmune diseases in close and other relatives, the location of vitiligo lesions in relation to the occurrence and duration of vitiligo. If necessary, other available data from medical records were included in the questionnaire. The age of the participants was calculated as their decimal age in years, based on the decimal calendar, using their date of birth and date of examination (7). The diagnosis of vitiligo was set by a competent dermatologist on the basis of medical history, physical examination and, if necessary, examination with a Wood's lamp, which allows detection of depigmented maculas in lighter skin types (1). Applying the standard classification, vitiligo was diagnosed as one of the following clinical types: segmental and non segmental (focal, acrofacial, generalized and universal) (1, 2, 8). The presence of polyosis, halo nevus, and Koebner's phenomenon were also noted. The Ethics Committee of the Institute gave its approval to this research.

Statistical analysis

Standard statistical methods (absolute number, percentage, minimum, maximum, average, standard deviation) were used. Statistical analysis was performed on a personal computer, using the statistical software STATISTICS 8.0550, licensed to the University of Novi Sad.

Results

The study involved 75 children and adolescents with vitiligo, 47 girls (62.7%) and 28 boys (37.3%). The subjects were aged 10.81 ± 4.06 years, and vitiligo occurred at the age of 8.46 ± 4.19 years. The duration of the presence of vitiligo in patients before introduction to the study was 2.60 ± 2.61 years. In 27 (36.0%) subjects provoking factors that

preceded the origin of vitiligo were identified. The most common “trigger” was stress - in 18 children (66.7%), in significantly fewer these factors were sun-burn - in 4 children (14.8%) and varicella in 2 girls (7.4%).

Of the 75 children and adolescents with vitiligo tested, three children (4.0%) had associated endocrine and/or autoimmune diseases. One boy (1.3%) suffered from type 1 diabetes mellitus (T1DM), with vitiligo preceding it. In one girl (1.3%) localized scleroderma appeared after vitiligo. Another girl (1.3%) was diagnosed with hypothyroidism and vitiligo as was subsequently reported. General laxity was found in 10 patients (13.3%), and allergic diseases in 9 children (12.0%), specified as follows: 3 children with asthma (4.0%), atopic dermatitis in 4 children (5.3%) and urticaria in 2 (2.7%) children.

A positive family history of vitiligo was found in 19 (25.3%) children, and for other endocrine and/or autoimmune disease in 50 (66.7%) patients. The most common were thyroid disorders, found in 25 (33.3%) patients - 4 children had (16.0%) hypothyroidism

in the family, hyperthyroidism 4 (16.0%), goiter 3 (12.0%), thyroid cysts 3 (12.0%) and other diseases of the thyroid gland 11 children (44, 0%). A positive family history of T1DM was obtained in 13 subjects (18.0%), type 2 diabetes mellitus (T2DM) in 21 (29.2%), alopecia areata in 7 (9.7%), rheumatoid arthritis in 5 (6.9%) and systemic lupus erythematosus (SLE) in 1 subject (1.4%). 3 (4.0%) of the observed children and adolescents had a positive family history for psoriasis.

The initial vitiligo lesions were most often found on the head and neck - in 33 children (44.0%), followed by the upper limbs - in 15 children (20.0%) (Table 1). Non segmental vitiligo was diagnosed in 69 (92%), and segmental vitiligo in 6 children and adolescents (8.0%). The most common type of vitiligo was generalized, in 32 (42.7%), followed by acrofacial - in 29 subjects (38.7%) (Table 2). Polyosis was found in 28 (34.1%), halo nevus in 35 (42.7%), and Koebner's phenomenon in 19 (23.2%) children and adolescents with vitiligo.

Table 1 Specified types of vitiligo in children and adolescents

Type of vitiligo	Frequency of specified type of vitiligo (n;%)
Generalized	32 (42.7)
Localized	8 (10.6)
Segmental	6 (8.0)
Acrofacial	29 (38.7)
Universal	-
Total	75 (100.0)

Table 2 Localization of initial lesions of vitiligo

Initial vitiligo lesions localization	Frequency of initial lesions (n;%)
Head and neck	33 (44.0)
Upper limbs	15 (20.0)
Trunk	13 (17.3)
Perineum	3 (04.0)
Lower limbs	11 (14.7)
Total	75 (100.0)

Discussion

Vitiligo was diagnosed in 47 girls (62.7%) and 28 boys (37.3%) and the finding is congruent with previous studies, unlike in adults, where vitiligo is equally present in both sexes (2, 3, 4, 9, 10). The subjects were aged 10.81 ± 4.06 years, similar to the results of Iacovelli et al. (9.5 years) and Kakarou et al. (11.4 ± 4.89 years) whose research also involved children and adolescents with vitiligo (11, 12). Vitiligo occurred at the age of 8.5 ± 4.2 years, similar to the research by Kakarou et al., where the average age of occurrence of vitiligo was 7.7 ± 3.8 years (12). The duration of the presence of vitiligo before introducing the subjects to the study was 2.60 ± 2.61 years, which is one to three years shorter than the period specified by other findings (11, 12). We noticed that the age at which vitiligo occurs and the age at the first visit to the dermatologist differ. The reason is probably that in lighter-skinned children, vitiligo is observed only after exposure to ultraviolet rays and tanning of the surrounding skin, so it only then causes concern in parents and a visit to the doctor (6).

Patients with vitiligo often associate the disease with a significant event, which occurred several months before the occurrence of vitiligo (6, 13, 14). Among our subjects, the most common provoking factor was emotional stress (66.7%), which is consistent with the results of Ručević et al., where stress was also the most common “trigger” for the development of vitiligo in children (15).

Diabetes mellitus (both juvenile and adult form) occurs in 1% to 7.1% of patients with vitiligo, which is consistent with our findings, where DM1 was identified in 1.3% of the subjects (1, 16). The literature reported more frequent appearance of vitiligo among patients with scleroderma and morphea than in the general population (17). Broniarczyk-Dyla et al. described the occurrence of vitiligo, lichen planus and morphea in the same

patient (18). In our research, one girl (1.3%) was diagnosed with localized scleroderma, which occurred after vitiligo. The incidence of allergic disorders corresponds to our previous study of vitiligo in children (12.0%), as well as the research of Iacovelli et al. (6, 11).

A family history of an associated endocrine and/or autoimmune disease is more common in children with vitiligo compared with children without vitiligo (2, 19, 20). Epidemiological studies show that 11.5% to 35% of children with vitiligo have relatives with the disease, as opposed to about 8% of adult patients (2, 3, 4, 5, 6). In 19 (25.3%) of our subjects a positive family history of vitiligo was found, which is consistent with our previous research, but also with the findings of Mutairi et al., Pajvani et al., Iacovelli et al. and Kakarou et al. It differs from the findings of Zhi et al. and Handa et al. (positive family history in 11.1% and 12.2% of children) (3, 4, 6, 9, 11, 12, 19, 21). Reference data indicate that there are different modes of inheritance of vitiligo in relation to age and clinical features, ethnic origin, association with certain MHC haplotypes, which could explain the differences in findings (7, 10, 21, 22, 23).

In adult patients, a significant association between familiar non segmental vitiligo and MHC-B46 was revealed. In contrast, MHC-A31 and CW4 are frequently present in patients with a negative family history of vitiligo, when the lesions occur in later life, as opposed to patients with segmental vitiligo (22). In children with a positive family history of vitiligo, an earlier start of vitiligo (up to 7 years) was noticed (21). We believe that further epidemiological studies to determine MHC haplotypes in children and adolescents with vitiligo will explain the complex inheritance of vitiligo.

The etiology and pathogenesis of vitiligo is not sufficiently clear. Increased frequency of vitiligo in some families and association with certain genetic loci suggest the importance of heritage (24, 25, 26). The de-

termined disorders of humoral and cellular immunity and association with autoimmune diseases suggest that autoimmunity in vitiligo may have a genetic basis (26, 27, 28, 29). In our study, a positive family history for endocrine and/or autoimmune diseases, apart from vitiligo, was found in as many as 50 children (66.7%). However, if we exclude T2DM, then 38.6% of subjects recorded a positive family history for an autoimmune and/or endocrine disease, which is consistent with the results of Kakarou et al. (12).

Our finding indicates the importance of heritage and events in the development of autoimmune vitiligo, as suggested by data from the literature (25, 30, 31, 32, 33). The largest number of children 25 (34.7%) had a thyroid pathology in the family, a higher number in relation to research in Greece, and less than in the findings of Pajvani et al. (12, 21). The presence of large number of relatives with thyroid disorders may be explained by the fact that 44.0% of subjects could not specify it, so we have to accept this data with caution (33). A positive family history of T1DM was found in 13 children (18.0%), whereas in our previous study T1 DM was notified in 12.0% of the observed group (19). Alopecia areata, whose pathogenesis has an important role the immune system, was present in 9.7% of the relatives of the children and adolescents with vitiligo, which is similar to the results of the research by Pajvani et al. (21). The literature describes a higher prevalence of psoriasis in patients with vitiligo. Both diseases occur in genetically predisposed people and are based on a T cell-mediated response (34). Although in our study none of the subjects suffered from psoriasis, it is important to note that in 3 (4.0%) children psoriasis was recorded in the family. Further studies are certainly required where the diagnosis of endocrine and/or autoimmune diseases listed in the family history could be confirmed on the basis of objective criteria (33).

Generalized vitiligo is a common type of vitiligo, regardless of age (1, 2, 9, 17). In our study, the most common type of vitiligo was also generalized, in 32 children (42.7%), which is consistent with the results of Zhi et al., Jaisankar et al. Al-Mutairi and et al. (3, 5, 10). We found a higher incidence of acrofacial vitiligo (38.7%) compared to the studies of Zhi et al. (7.6%) and Al-Mutairi et al. (13.6%), which is probably explained by the fact that our study included adolescents (42.7% of subjects were adolescents), while in these studies only children under the age of 12 years were observed, when acrofacial vitiligo is quite rare (2, 3, 5). Non segmental vitiligo was diagnosed in 69 (92.0%), and segmental vitiligo in 6 children (8.0%), which is identical to the findings of Al-Mutairi et al. This differs from the findings of Zhi et al. (19.4%) and Halder et al. (20.0%) (2, 3, 5).

The lower incidence of segmental vitiligo compared to the literature data is probably explained by the fact that about 40% of our sample consisted of adolescents, while the incidence of segmental vitiligo (from 17% to 28%) is related to vitiligo in childhood (under the age of 12 years) (2, 9). The initial vitiligo lesions were most often on the head and neck in 33 children (44.0%), followed by the upper limbs, in 15 patients (20.0%), which is similar to the findings of Iacovelli et al., Handa et al. and Cho et al., where the initial vitiligo lesions were also on the head, followed by the upper limbs (4, 11, 35).

Polyosis (leukotrichia) or “white lock of hair” is a localized loss of pigment in the hair, due to destruction of melanocytes in the hair bulb (1). Polyosis frequency in patients with vitiligo ranges from 9% to 45% (4, 9, 17). In our sample, leukotrichia was present in 28 children (37.3%), and this finding is consistent with the cited data (1, 17). Halo nevus (Sutton nevi) is where the lesions are surrounded by a depigmented “ring”. Confluence of these nevi during regression may

form a vitiligo-like an irregular depigmented macula. Sutton nevi occur more frequently in younger patients, up to 20 years of age (1, 9, 17). Halo nevi were diagnosed in 35 subjects (46.7%), in contrast to the study by Al-Mutairi et al. (8.0%) and Handa et al. (4.44%) (3, 4). Our finding corresponds to the observation of Rhodes, where halo nevi may be present in 0.5 to 50% of patients with vitiligo (36).

The appearance of new vitiligo lesions at the site of previous injuries, surgical scars, burns from ultraviolet rays, radiographic procedures, rehabilitation from skin diseases, but also from the pressure of belts, suspenders and bras is known as the isomorphic irritating effect or Koebner's phenomenon (1). As children are prone to injuries during play, the first places where vitiligo lesions are noticed are usually the elbows, knees, shins and hands (1, 2, 8, 9). Koebner's phenomenon was found in 19 subjects (25.3%), which is consistent with the findings of Al-Mutairi et al. and our previous study, and differs from the findings of Handa et al. (11.3%) (3, 4, 6).

Conclusion

The clinical and epidemiological characteristics of vitiligo in the observed children and adolescents are consistent with previous studies of vitiligo in children, both in our region and in other countries (3, 4, 5, 6, 10, 11, 12,

33, 35). We confirmed the higher incidence of vitiligo in girls, the most common type of vitiligo was generalized, and the most common initial localization of the lesions was on the head and neck. Certain differences in the findings, such as the lower frequency of segmental and the higher incidence of acrofacial vitiligo may be methodological, since most previous studies examined the characteristics of vitiligo in younger children (under 12 years of age), while both our research and the studies of Iacovelli et al. and Kakarou et al., also included adolescents (3, 5, 11, 12, 33). Large epidemiological studies of vitiligo in children have only been performed in India and China and the differences in our results may be due to the relatively small group observed and ethnic differences (4, 5). We are convinced that further research with a much larger number of subjects in Europe will confirm our findings and contribute to a better understanding of vitiligo in children and adolescents.

Authors' contributions: Conception and design: SP; Acquisition, analysis and interpretation of data: SP, VD and DK; Drafting the article SP; Revising it critically for important intellectual content: VD and DK.

Conflict of interest: The authors have declared they have no conflict of interest. The study was not sponsored by a foreign institution.

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