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The Psychosocial Aspects of Vitiligo: A Focus on Stress Involvement in Children with Vitiligo

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1. Introduction

Skin interacts with the environment and serves as a means to communicate. Skin diseases can affect both self-image and social relationships, particularly during the vulnerable times of childhood and adolescence. Vitiligo itself has more than a 3000 year history, with the first reports of the condition chronicled in early Vedic and Egyptian texts; vitiligo was often confused with leprosy and led to greater stigmatization of affected individuals (Millington and Levell, 2007).

The psychosocial aspects of vitiligo can be described by stress as a potential cause or effect of the disease, the anxiety or depression of vitiligo patients, or the impact of vitiligo on patient quality of life.

There are few reports of the psychosocial impact of vitiligo on children and adolescents although vitiligo can have a serious impact on their lives. This ranges from vitiligo having no correlation with stress (Prcic *et al.*, 2006) to involvement of stressful events in 50% of cases (Barisic-Drusko & Rucevic, 2004). Psychological vulnerability can also influence the onset and evolution of psychosomatic dermatoses, alongside the presence of stressful events. A recent study (Schwartz *et al.*, 2009) on the temperament of children with vitiligo revealed that these children score high on the “harm avoidance” scale, meaning that compared to their healthy siblings, children with vitiligo seem to have a greater fear of strangers and have a heightened response to any changes in a close relative. Age, change of location, and situational or environmental alterations can also be predictors of stress.

About half of vitiligo vulgaris patients have onset of their illness during childhood, which can increase psychological distress during the formative years (Siverberg, 2010). On the other hand, in the prepubertal period, children are not focused yet on their physical appearance, so an early onset could also act as a “protective factor”, enabling the child to develop compensatory mechanisms of coping with disease and ways to strengthen self-esteem (Hill-Boeuf & Porter, 1984).

We performed a pivotal study to add to this body of knowledge, with the purpose of observing stress involvement before the onset of childhood vitiligo and during its subsequent progression. Furthermore, we relate this to the psychosocial aspects of all vitiligo patients, making our study relevant to the disease entity as a whole.

2. A pivotal study of stress involvement in children with vitiligo

Our study was performed at the Department of Dermatology of Cetatea Histria Polyclinic in Bucharest, Romania. Patients (children and adults) were referred to the polyclinic by general practitioners in the city and its surrounding areas (approximately 500,000 inhabitants). There were 41 cases of vitiligo in 9,940 new dermatology consults in children less than 16 years of age from the time period between March 2001 and December 2007. The incidence of vitiligo was 0.45% of all dermatologic conditions in children.

Nearly 83% (34/41) of childhood vitiligo cases had disease onset less than 9 months before evaluation or had recent progression and these cases were included in our analysis. The study design was case-control, with each patient having an age- and gender-matched counterpart. Controls had skin diseases with a well-established etiology with a presumably low psychosomatic component, or had skin diseases unrelated to stress (*e.g.*bacterial, viral, and fungal infections, Table 1). We selected interviews with children and parents taking into consideration potential stressful situations that appeared during the year before evaluation and excluding those that occurred after onset or exacerbation of disease. This was based on the theory that life events can influence susceptibility to vitiligo through increased levels of stress.

The situations reported were classified into: events related to school and education, family changes, personal illnesses/accidents/surgeries, and psychosocial trauma (frightening situations to children). This classification, made after the collection of data, could be considered arbitrary without other references, but we determined this categorization to underline the importance of events related to events of importance in childhood.

Odds ratios were calculated and χ^2 and *t* tests were used in order to study the differences between the groups, and used the standard significance value of $p \leq 0.05$.

2.1 Results

2.1.1 Demographics

There were 16 girls (47%) and 18 boys (53%) in the vitiligo group. Mean age was 11 years old (standard deviation, SD=3.1). There was no significant difference (p=0.38) between the mean age in girls (10.5 years- SD=3.18) and boys (11.44 years, SD=3.05).

Most of children (38%) had recent onset (less than 3 months) of disease or recent progression (an additional 38%). The youngest child with vitiligo was 4 years old. Nearly 21% of children had a family history of vitiligo. One in five children had divorced parents. Halo nevi were observed in 15% of patients. Associated thyroid dysfunction was found in 1 girl and 1 boy (6%). Boys had mostly acrofacial lesions and girls most commonly had vitiligo vulgaris.

Data regarding mean age, distribution according to age group, lesion type, family, and onset of lesions was collected (Table 1).

2.1.2 Stress involvement

In vitiligo group, 18 o f 34 (53%) children mentioned a stressful event compared to 6 of the controls (17.6%). The difference was statistically significant (χ^2 =7.79, p=0.005). The odds ratio was 5.25 [95% CI: 1.73-15.92]. Girls experienced mostly one event with an important impact on vitiligo, compared to boys who reported between 1-3 related events. In the vitiligo group, girls with acrofacial lesions and boys with vitiligo vulgaris were most often affected by stressful situations. These were situations related to school (beginning of education, exams, over-solicitation, or change of school). Psychosocial trauma was also a key impact factor (Tables 2-4).

	Females	Males	Total (%)
Family			
Only child	7	8	-
Socio-professional level			
High	5	6	32
Average	6	9	44
Low*	5	2	23.5
Separated/divorced parents	2	5	20.6
Onset of Lesions			
< 3 months	7	6	38
3-6 months	2	4	
6-9 months	0	2	
Recent progression	7	6	38
Vitiligo Type			
Acro-facial	4	10	41
Vulgaris	3	4	20.6
Focal	9	4	38.2
Mean Age	10.5 years (SD=3.18)	11.44 years (SD=3.05)	11 years (SD=3.1)
Age			
1. <5 years	1	0	
2. 5-9 years old	7	6	38.2
3. 10-14 years old	8	12	58.8
Controls			
Mycosis	1	2	
Tinea pedis	0	0	
Tinea manuum	2	3	
Tinea corporis/faciei	5	7	
Pityriasis versicolor	5	2	
Verruca	3	4	
Impetigo			

*mother housewife or one parent unemployed/retired

Table 1. Demographic Data

Number of events	**Vitiligo Group (n=34)**				**Control Group (n=34)**				**(p)***		
	Females	Males	Total		Females	Males	Total		Fem.	Mal.	Total
	Mean/ SD	Mean/ SD	Mean	SD	Mean /SD	Mean /SD	Mean	SD			
	0.625/ 0.61	0.83/ 1.04	**0.73**	0.86	0.18/ 0.39	0.16/ 0.37	**0.17**	0.38	0.01	**0.01**	**0.009**
	N	**N**	**N**	**%**	**N**	**N**	**N**	**%**			
1 event	8	5	**13**	72.2	3	3	**6**	100%			
2 events	1	2	**3**		0	0	**0**				
3 events	0	2	**2**								

*SD= standard deviation
N= number of cases

Table 2. Comparison of Stressful Events in Vitiligo

	Vitiligo Vulgaris	**Acro-Facial Vitiligo**	**Focal Vitiligo**
Females			
- Number of cases	9	4	3
- History of stress	4	3	2
Males			
- Number of cases	4	10	4
- History of stress	3	5	1

Table 3. Comparison of Stress Involvement

Type of event	Vitiligo group			Control group			(p)		
	Females	Males	Total	Females	Males	Total	Females	Males	Total
1. ***Related to School and Education***	4	3	7	3	3	6	0.6	0.6	0.49
- Beginning of school	3	1	4	2	0	2			
- Examinations	0	1	1	1	1	2			
- Change of school or class	0	1	1	0	0	0			
- Problems/too many homeworks or studies	1	0	1	0	2	2			

Type of event	Vitiligo group			Control group			(p)		
	Females	Males	Total	Females	Males	Total	Females	Males	Total
2. Familial Issues	1	3	4						
- disputes	1	0	1						
- death of a family member	0	1	1						
- change of residence	0	1	1						
- new person in the family	0	1	1						
3. Personal Events									
-illness/accident/ operation	1	1	2						
4. Psychosocial Trauma	0	1	1						

Table 4. Types of Stressful Events in Vitiligo and Control Patients

3. Discussion

The spectrum of incidence for vitiligo in the pediatric population ranges from 0.09% in Singapore (Giam, 1998) and Denmark (Howitz et al., 1977) to 2.6% in India (Jaisankar et al., 1992), 4.1% in Thailand (Wisuthsarewong & Viravan, 2000) and 5% in Eastern Saudi Arabia (Alakloby, 2005). Studies that reported vitiligo is more common in females: India (Handa &Dogra, 2003, Jaisankar et al., 1992), Kuwait (Nanda et al., 1999), Croatia (Prcic et al., 2006), China (Lin et al, 2011), differed from our data. The mean age (11 years old) of our cohort was higher than other reports (between 6.2 years to 9 years) (Handa & Dogra, 2003, Hu et al., 2006, Nanda et al., 1999, Prcic et al., 2006). A family history of vitiligo (about 20%) was comparable to those of Akrem's (18%) (Akrem et al., 2008), but higher than of Lin's (Lin et al., 2011) (13.5%). There are other results from 12-13% (Cho et al., 2000, Handa & Dogra, 2003) up to 27% (Al-Mutairi et al., 2005). The dimensions of our study sample could be considered a limitation and account for differences in demographics from other studies.

3.1 Stress involvement

There is a lack of studies in pediatric dermatology to which to compare our data. Our results, which found that 53% of pediatric patients reported stress involvement in the natural history of their disease, was statistically significant: χ^2 =7.79, p=0.005 with an odds ratio of 5.25. The percentage of stress involvement seems to be consistent with the results of Barisic-Drusko[3] and their study of childhood vitiligo compared to childhood psoriasis mentioned that in children with vitiligo (n=65), onset was related to psychological factors in 56.9% of cases compared to children with psoriasis, in which onset was mostly related to the presence of an inflammatory focus. Stress seemed to appear more often in segmental vitiligo[14]. However, there are also reports that did not find a significant correlation of childhood vitiligo with the presence of stressful events (Prcic et al., 2006).

Based on this data, periods of adjustment to new conditions, such as the beginning of education (school or kindergarten), being an only child, or having separated parents (particularly in boys) could be considered special situations in which children with vitiligo need more support and require the intervention of families, teachers and doctors.

In a previous study with a smaller sample size, we found an even higher rate of stress involvement (57%) (Manolache et al., 2009a) in children with vitiligo. We also studied, in a similarly designed case-control study, children with alopecia areata (43 cases) and psoriasis (41 cases). In the alopecia areata group, we found stress involvement in 58% of cases (16% in controls). This difference was strongly significant (χ^2 =14.36, $p<0.0001$). The odds ratio was 7.14 [95% CI: 2.59-19.63]. There was no difference between girls (60%) and boys (55.5%) (Manolache et al., 2009b). The types of events reported by children with alopecia areata were mostly related to school, *i.e.,* beginning school or kindergarten, exams, change of class or school, problems with schoolmates or teachers, too many classes or homework, children feeling over-solicited (56%). In children with psoriasis, stress was present in 41% of cases. Girls with psoriasis vulgaris and boys with guttate lesions were more often affected by stressful situations. Family issues (death, illnesses, disputes, parents working abroad, financial restrictions) were more often described, but school- related problems (exams or beginning school) were also prevalent.

In regards to adults, the importance of stressful events and the number of these events before the onset of vitiligo has been described in several case-control studies (Manolache &Benea, 2007, Papadopoulos et al., 1998). Stress is cited in 62-65% of patients (Firooz et al., 2004, Manolache & Benea 2007). Patients with vitiligo had a significant number of stressful events in the year preceding the onset of the disease as compared to controls (Prcic et al., 2006). In Agarwal's study (Agarwal, 1998), half of the patients with vitiligo reported stressful events before disease onset. Meanwhile, other reports (Picardi et al., 2003) found no differences between vitiligo patients and controls when comparing numbers of stressful events.

In our previous study, we found significant differences in the mean number of stressful events only between women with vitiligo and controls. There was no difference with men or the vitiligo cohort as a whole. These results were concordant with respect to those of Picardi *et al.*(Picardi et al., 2003). They also found no differences between vitiligo patients and controls regarding the total number of stressful events or the number of undesirable, uncontrollable, or major events. The difference between patients and controls was related to exposure to three or more uncontrollable events, which were more often reported by vitiligo patients. They suggest that alexthymia (the inability to verbally express emotions), insecure attachments, and poor social support systems could reduce patients' ability to cope with stress and could increase susceptibility to vitiligo.

Potential stressful situations reported in other vitiligo studies were marital or financial problems (Papadopoulos et al., 1998), loss of loved ones (*e.g.,* death, separation), illnesses, and changes in eating or sleeping habits (Papadopoulos et al., 1998). In a study by Silvan (Silvan, 2004), 40% of vitiligo patients experienced the death of a close friend or family member. In comparison, 25% of vitiligo patients experienced loss in a study by Papadopoulos; loss in this case meaning relocation, or the loss of friends, family, or familiar surroundings (Papadopoulos et al., 1998, Silvan, 2004).

Patients with vitiligo often have different perceptions of the etiology of their disease. Often, they believe that stress (30-60% of cases) or genetic background (24-32% of cases) may play a role (AlGhamdi, 2010, Firooz et al., 2004).

3.2 Psychiatric symptomology

Vitiligo patients tend to have high scores for anxiety (Gieler et al., 2000, Mechri et al., 2006), depression (Agarwal, 1998, Mechri et al., 2006), adjustment disorders (Mattoo et al., 2002), obsessive symptoms, and hypochondriasis (Elgowieni et al., 2003). Furthermore, depressive illnesses, generalized anxiety, mixed anxiety and depression, social phobia, agoraphobia, and sexual dysfunction are also common in vitiligo patients(Mechri et al., 2006). Patients with vitiligo also have high rates of alexthymia and avoidant behaviors (Picardi et al., 2003).

There are some studies comparing vitiligo (113 cases) with psoriasis (103 cases) that have found psychiatric morbidity in 33.63% of vitiligo patients compared to 24.7% of psoriasis patients (Mattoo et al., 2001). Sharma (Sharma et al., 2001) also made a comparison between psoriasis and vitiligo patients. They found depression in 23.3% of psoriasis patients and in 10% of vitiligo patients. Anxiety was found in equal rates in both groups (3.3%). Sleep disturbances were a problem in 56.6% of psoriasis patients and in 20% of vitiligo patients.

There are few studies on children with vitiligo and psychiatric symptomology. One study showed children with vitiligo were more depressed than non-affected children (Bilgic et al., 2010). Another study found no differences between children and adolescents with vitiligo and healthy subjects in regards to anxiety and depression (Prcic et al., 2006).

Vitiligo patients who cope well with their condition have higher self-esteem than individuals without the disorder. Those who cope poorly have significantly lower self-esteem, which suggests that response to disfiguring diseases is affected by basic ego strength. Younger patients and those individuals in lower socioeconomic groups show particularly poor adjustment skills (Porter et al., 1979).

3.3 Quality of life

Vitiligo has a definite psychosocial impact in adolescents that is correlated with lesion severity . The duration of the illness is directly related to physical health score (meaning physical functioning on the Pediatric Quality of Life Inventory [PedsQoL]) in children. Involvement of the face, head, or neck in boys and involvement of the genital area and legs in girls were related to impaired quality of life. Disease location may be considered important because of its effects on gender identity development (Bilgic et al., 2010).

Patients reporting negative childhood experiences described significantly more problems in social development than those who did not report negative experiences. Negative childhood experiences were significantly associated with more health- related quality of life (HRQoL, a self-reported measure of physical and mental health) impairments in early adulthood (Linthorst et al., 2008). The quality of life of adolescents with vitiligo is closely related to patient apprehension of the disease, ability to make psychosocial adjustments, and presence of psychiatric comorbidity, rather than the clinical severity of the condition itself (Choi et al., 2009). Age plays an extremely important part in adjustment to disease, with the junior high school years (11 to 14 years old) being particularly traumatic. Change of location or situation is a predictor of vitiligo-related stress. It is important to note, however, that children who develop other competencies that build self-esteem cope better with vitiligo (Hill-Boeuf & Porter, 1984).

More than half of vitiligo patients (56.5%) indicated that vitiligo moderately or severely affects their quality of life (Talsania et al., 2010). Dermatology Life Quality Index (DLQI) is the first dermatology-specific quality of life questionnaire developed in 1994, composed of 10 simple questions validated in different languages. The scores range from 0 to 30 (0-1: no effect on patient's life, 2-5: small effect, 6-10: moderate effect, 11-20: very large effect, 21-30: extremely large effect). The score in most studies represents a moderate impact of vitiligo on quality of life (6-10) (Dolatshahi et al., 2008, Kostopoulou et al., 2009, Mechri et al., 2006, Ongenae et al., 2005a, Radtke et al., 2009). The highest mean DLQI value was observed in the patient group aged 20-29 years (Radtke et al., 2009). Perceived severity and patient's personality were predictors of quality of life impairment (Kostopoulou et al., 2009). There were statistically significant relationships between DLQI scores and marital status, skin phototype, and disease progression, respectively (Al Robaee, 2007, Dolatshahi et al., 2008, Ongenae et al., 2005a). In particular, there was found to be a connection between impaired health-related quality of life and unstable marital relationships (Wang et al., 2011). Furthermore, vitiligo also negatively impacts the sexual lives of patients (Sukan &Maner, 2007).

Vitiligo of the face, head, and neck regions substantially affects DLQI, independently of the degree of disease involvement (Ongenae et al., 2005a). Quality of life is significantly impaired in females to a greater extent than males, as well as in cases affecting more than 10% of the body surface area (Belhadjali et al., 2007). Al Robaee (Al Robaee, 2007) observed that women are more embarrassed and self-conscious about their disease than men, as it impairs social life, personal relationships, sexual activities, and choice of clothing. The same study (Al Robaee, 2007), revealed a great impact of vitiligo on patients (DLQI 14.72). A significant correlation was noted between quality of life scores and depression as well as anxiety scores, respectively (Mechri et al., 2006).

DLQI scores do tend to be lower for vitiligo patients than for psoriasis patients (Ongenae et al., 2005b, Radtke et al., 2009), as vitiligo patients seem to exhibit better adjustment to their disease and experience less social discrimination than do psoriasis patients, however, the two groups do not differ on overall self-esteem scores (Porter et al., 1986).

Studies using Skindex-29 (SD-29, a dermatologic HRQoL instrument) to evaluate the quality of life revealed that patients with vitiligo were highly affected in both the functional and emotional aspects of QOL, with some sex differences (Kim et al., 2009). Generalized vitiligo, darker skin types, vitiligo located on the chest, and treatment in the past appeared to have an adverse impact on the psychosocial domains of quality of life (Linthorst et al., 2009).

3.4 Stigmatization

Stigmatization also plays an important part in the lives of vitiligo patients (Ongenae et al., 2005a). Avoidance and concealment of the disease are commonplace. Experiences of stigmatization are often perceived to be associated with cultural values related to appearance, status, and myths linked to the cause of the condition (Thompson et al., 2010). Patients with visible lesions are more prone to stigmatization (Schmid-Ott et al., 2007). Self-esteem and perceived stigmatization are significantly associated with degree of disturbance to the patient. Gender, age, and visibility of the condition are not significantly related to degree of disturbance, although an indirect relationship is observed.

4. Conclusion

Stressful situations can be correlated with the onset or progression of vitiligo. Often, one stressful situation with an important impact on a child's emotional balance is sufficient enough to trigger or exacerbate disease. Periods of adjustment to new conditions such as beginning education and school, being an only child, or having separated parents are reported to be important in terms of psychosocial impact for children with vitiligo and may require intervention.

In general, it is important to take into consideration the entire psychosocial profile of vitiligo patients, in particular pediatric patients. These are key to identifying potential stress-related triggers, predicting type of patient personality or psychological reactions due to vitiligo, and evaluating the impact of disease on patient quality of life.

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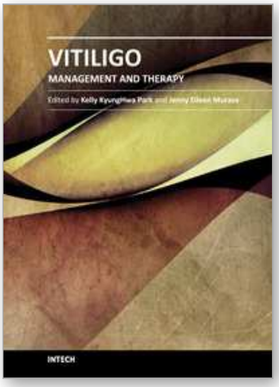

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