

# Characteristics of Childhood Vitiligo in Bangalore with special reference to associated Ocular abnormalities.

Belliappa PR<sup>1</sup>, Priya KS<sup>2</sup>, Umashankar N<sup>3</sup>, Vivekananda<sup>4</sup>, Leena<sup>5</sup> and Lokanath<sup>6</sup>

<sup>1, 2</sup> Assistant Professor, <sup>3</sup>Associate Professor, <sup>4</sup>Professor <sup>5,6</sup>Senior Resident,  
Dept of Dermatology Venereology and Leprosy, Rajarajeswari Medical College and  
Hospital, Bangalore, Karnataka.

**Address for correspondence:** drbelliappa@gmail.com

## Abstract

*Background:* Vitiligo is an acquired depigmentary disorder, where approximately 50% of the cases have the onset of their disease prior to the age of 20 years and 25% prior to the age of 14 years. There are limited data on the clinical characteristics including associated cutaneous and ocular abnormalities in childhood vitiligo.

*Aim:* To evaluate the various clinical characteristics and associated cutaneous and ocular abnormalities of childhood vitiligo.

*Methods:* In a prospective, hospital based study over a period of two years; the epidemiology of childhood vitiligo was studied including associated cutaneous and ocular abnormalities.

*Results:* Of the total 122 children studied, majority of them were females (n=75, 61.5%), the mean age of presentation was 8 years. Progression of lesions was present in 36 children (29.5%). The most common site of initial lesion was head and neck followed by lower limbs, genitalia, trunk and upper limbs. Eight children (6.6%) had a history of trauma prior to onset eighteen children (14.8%) had a family history of vitiligo. The most common type was vitiligo vulgaris seen in 45 children (36.9%) followed by segmental type in 33 children (27%). Leukotrichia was seen in 51 children (41.8%), while Kobner phenomenon was observed in 30 children (24.6%). Fifteen children (12.3%) had an associated cutaneous disorder. These associated disorders were halo nevi (4.9%), alopecia areata (2.5%), canities (1.6%), and cafe au lait macule, naevus depigmentosus, lichen nitidus, lichen striatus each (0.8%). Thirty children (24.6%) had an associated ocular disorder. These associated disorders were eyelid vitiligo (21.3%), depigmented spots in the iris (1.6%), lamellar cataract and persistent papillary membrane each (0.8%).

*Conclusions:* Childhood vitiligo in Bangalore showed preponderance in females and greater number of children (72.4%) present with depigmentation in the age group of 7 to 12 years. Majority of patients (77.9%) had less than 5% body surface area

involvement. Low incidence of ocular pigmentary abnormalities in comparison with adult population might suggest that childhood vitiligo patients do not have ocular pigmentary abnormalities in the beginning, but as they age or as the disease progresses they may develop ocular pigmentary changes.

**Key words:** Vitiligo, ocular, cutaneous

## **Introduction**

Vitiligo is an acquired skin disorder characterized by sharply demarcated lesions of variable size and shape that has a tendency to increase in size during the patient's lifetime<sup>1</sup>. It carries a risk for co-existing ocular abnormalities, particularly iritis. Worldwide, vitiligo is a relatively common cause of leukoderma. Vitiligo affects between 0.5 and 4% of world population<sup>2</sup>. Half of all patients develop the disease in childhood and adolescence before 20 years, making vitiligo an important element of paediatric dermatology<sup>3</sup>. Of the total population of patients with vitiligo, between 23% and 26% are reported to be children less than 12 years. Vitiligo beginning at childhood can be associated with significant psychological trauma that may have lasting effects on the person's self-esteem<sup>7</sup>. Vitiligo has a negative impact on the quality of life of children<sup>4</sup>. There is paucity of data on the epidemiology of childhood vitiligo Worldwide<sup>5, 8, and 16</sup> and also from India<sup>6, 9</sup>. In the present report, we present the profile of childhood vitiligo as seen over 2 years in 122 children. This study assessed the epidemiology of childhood vitiligo and associated cutaneous and ocular abnormalities.

## **Materials and Methods**

This was a prospective study conducted in a referral hospital in the Department of Dermatology for a period of 2 years from August 2008 to July 2010. During this period, all children less than 12 years of age were screened for vitiligo. Only untreated patients were included in the study. A total of 122 children with vitiligo of both sexes were enrolled. They were questioned in detail regarding the age of onset, site of initial lesion, duration of disease, progression and associated cutaneous disorder. Precipitating factors such as trauma, illness, stress and contact with chemicals were specifically asked for. History of ocular symptoms and systemic illness like diabetes, thyroid dysfunction, anaemia and Addison's disease were recorded. History of vitiligo, premature canities or any other autoimmune disorder in the family was noted. A detailed dermatological examination was carried out and a thorough systemic examination was made to record any associated systemic disorders. An ophthalmologic examination was done by an ophthalmologist in all children. The

diagnosis of vitiligo was made based on clinical features and Wood's lamp. Trichrome vitiligo, quadrichrome vitiligo and associated cutaneous disorders were specifically looked for. In each case, body charting, extent of body surface involvement, leukotrichia and Kobnerization was recorded. Each case was classified into recognized patterns of vitiligo namely vitiligo areata, segmental vitiligo, acrofacial vitiligo, lip tip vitiligo, vitiligo mucosae, vitiligo vulgaris and vitiligo universalis.

## Results and Observations

A total of 122 children were enrolled during the study period. The male to female ratio in the study was 38.5% to 61.5% [1:1.7], with females in the majority (n=75 female, and n=47 male). The mean current age of the children visiting our hospital was 8 years. Eighty -three children (68%) were in the age group of 7 to 12 years. The youngest child was 1 year old.

The commonest age of onset was between 4 to 6 years and 79.5% of children were less than 9 years when the depigmentation started (Table 1).

Table 1. Age and sex distribution at the age of onset 122 children with vitiligo

Age group (in years)	Number of patients		Total (%)
	Males (%)	Females (%)	
0-3	6	7	13 (10.7)
4-6	20	26	46 (37.7)
7-9	14	24	38 (31.1)
10-12	7	18	25 (20.5)
	47	75	122

Vitiligo was present for a mean duration of 14 months before the first consultation (range 1 month to 7 years). Progression of lesions was present in 36 children (29.5%) at first consultation.

The most common site of initial lesion was head and neck followed by lower limbs, trunk and upper limbs (Table 2).

Table 2. Site of initial lesion in 122 children with vitiligo

Site	Number of patients		Total (%)
	Males (%)	Females (%)	
Head & neck	26	41	67 (54.9)
Trunk	4	6	10 (8.2)
Upper limb	3	1	04 (3.3)
Lower limb	11	19	30 (24.6)
Genitalia	3	8	11 (9)
	47	75	122

Eight children (6.6%) had a history of trauma prior to onset of vitiligo. Pyoderma was seen in 6 children (4.9%) and varicella in 3 children (2.5%) prior to onset of vitiligo.

Eighteen children (14.8%) had a family history of vitiligo and twelve children (11.3%) had a family history of premature greying.

First-degree relatives (parents/siblings) were affected in 16 children (88.9%) and second-degree relatives (grandparents/uncles/aunties) in 2 children (11.1%).

The most common type was vitiligo vulgaris seen in 45 children (36.9%) followed by segmental type in 33 children (27%) (Table 3).

Table 3. Types of Vitiligo in 122 children with vitiligo

Vitiligo type	Number of patients		Total (%)
	Males (%)	Females (%)	
Vitiligo vulgaris	15	30	45 (36.9)
Acrofacial	7	6	13 (10.7)
Lip-tip	0	1	01 (0.8)
Mucosal	5	11	16 (13.1)
Focal	7	7	14 (11.5)
Segmental	13	20	33 (27)
	47	75	122

Among the segmental type of vitiligo in children, trigeminal dermatome was most commonly involved in 20 children (60.6%) followed by sacral area in 4 children (12.1%).

In 117 children (95.9%) body surface area involved was less than 20%. A majority of them (77.9%) had less than 5% body surface area involvement.

Leukotrichia was present in 51 children (41.8%), while Kobner phenomenon was observed in 30 children (24.6%). Perilesional pigmentation was seen in 10 children (8.5%) and perifollicular pigmentation was present in 13 children (12.3%).

Fifteen children (12.3%) had an associated cutaneous disorder. These were halo naevi in 6 children, alopecia areata in 3 children (2.5%), premature canities in 2 children (1.6%), and cafe au lait macule, naevus depigmentosus, lichen nitidus and lichen striatus in one child each(0.8%).

Thirty children (24.6%) had an associated ocular disorder. These were eyelid vitiligo in 26 children(21.3%), depigmented spots in the iris in 2 children (1.6%), lamellar cataract and persistent papillary membrane in one child each(0.8%).

## **Discussion**

Vitiligo is common in India, having a prevalence of 0.46 – 8.8%<sup>10</sup>. Half of all patients develop the disease in childhood and adolescence before age 20 years, making vitiligo an important aspect of paediatric dermatology<sup>3</sup>. Indian studies on childhood vitiligo have reported a prevalence of 2.6%<sup>6</sup>.

### ***Age distribution:***

In our study of 122 children, the commonest age at presentation was between 7 and 12 years, which are in agreement with the study of Handa et al<sup>9</sup> where the commonest age at presentation was between 9 and 12 years. The mean current age of children visiting our hospital was 8 years. This is in agreement with the study of Zhi Hu et al<sup>16</sup>, where the children presented at a mean age of 8.8 years. The youngest child in our study was 1 year old. Earlier studies have reported anecdotal cases of congenital vitiligo<sup>11, 12</sup>. Our study did not have any case of congenital vitiligo.

### ***Sex distribution:***

The prevalence of vitiligo was found to be higher in girls than in boys (61.55 vs 38.55) in our study. The male to female ratio was 1:1.7. In earlier published reports<sup>5, 6, 9</sup> on childhood vitiligo, the majority of cases were in girls. The explanation could be that patients or parents worry more and tend to seek treatment for cosmetically disfiguring, depigmenting patches more frequently in girls. However, boys and girls were equally affected in a study by Zhi Hu et al<sup>16</sup>.

### ***Age of onset:***

In this study, the commonest age group at which depigmentation initiated in both males and females were between 4 and 9 years, constituting 68.9% of the cases. Handa et al<sup>9</sup> reported that more than 50% of the cases had onset of the disease between 4 and 8 years of age. Zhi Hu et al<sup>16</sup> reported it to be 42.5%. The peak onset has varied among different studies, with many authors stating that most cases are acquired early in life, between 4 and 12 years of age. When comparing the age at presentation and age at onset, age at presentation in most cases is between 7 and 12 years and age at onset is between 4 and 9 years of age. This difference between age of onset and age of presentation could be because patients might ignore the initial lesion and seek treatment only after the disease progresses.

### ***Duration and progression:***

The duration of depigmentation varied from 1 month to 7 years. The mean duration before the first consultation was 14 months. This is in agreement with study of Zhi Hu

et al<sup>16</sup>, where the mean duration of the disease was 1.6 years. This delay could be due to the stigma associated with vitiligo or traditional medications taken before reporting to us. Progression of lesions was present in 29.5% at first consultation.

***Site of initial lesion:***

In our study, the most common site of initial lesion was head and neck followed by lower limbs, genitalia, trunk and upper limbs in that order. Handa et al<sup>9</sup> also reported that the most common site of onset was head and neck. Jaishankar et al<sup>6</sup> reported the various sites of onset to be lower limbs, head and neck, upper limbs and thorax in that order.

***Precipitating factors:***

The commonest precipitating factor was trauma noted in 6.6%, showing vitiligo lesions at extra traumatic sites. Similarly the other factors were pyoderma in 4.9% and varicella in 2.5%. However, other factors like sun exposure, systemic illness or contact with chemicals were not seen.

***Family history:***

In our study, 14.8% of children had a family history of vitiligo and 11.3% had a family history of premature greying. In another study by Halder et al<sup>5</sup>, family history of vitiligo was present in 35% of children and increased incidence of premature greying. Handa et al<sup>9</sup> reported family history of vitiligo in 12% of children. Jaishankar et al<sup>6</sup> reported relatively lower figure of 3.3%. Of the 14.8% of children with a family history of vitiligo, first-degree relatives were affected in 88.9% and second-degree relatives were affected in 11.1%. However, Handa et al<sup>9</sup> reported that second-degree relatives were affected more than first degree ones (64.5% vs 35.5%).

***Type of vitiligo:***

In our study vitiligo vulgaris was the most common clinical type seen in 36.9% followed by segmental type in 27%. In earlier studies on childhood vitiligo as well, vitiligo vulgaris was the frequent type reported. Jaishankar et al<sup>6</sup> in their study of 90 children reported segmental vitiligo as the second most frequent presentation, occurring in 21% of patients, closely followed by focal vitiligo in 20.1%. However, Halder et al<sup>5</sup> reported focal vitiligo as the second most common presentation. The percentage of segmental vitiligo has been reported to vary from 19% to 21% in children. Focal vitiligo was seen in 11.5%. This is in concurrence with earlier reports.

Lip-tip vitiligo was the least common type seen in our study population. Halder et al<sup>5</sup> and Jaishankar et al<sup>6</sup> reported acrofacial type to be the least common. Acrofacial

vitiligo was seen in 10.7%. Handa et al<sup>9</sup> reported universal vitiligo to be the least common. Universal vitiligo was not observed in our study.

We observed mucosal vitiligo in 13.1%. Jaishankar<sup>6</sup> et al reported a similar figure of 13.8%. Handa et al<sup>9</sup> reported a considerably lower figure of 0.6%, while Halder et al<sup>5</sup> had no patients with mucosal vitiligo.

Among the children affected with segmental vitiligo, trigeminal dermatome was most commonly involved in either sex in our study. Hann et al<sup>13</sup> in their study on segmental vitiligo of all age groups reported similar findings.

#### ***Body surface area involvement:***

Our study showed body surface area involvement of less than 20% in 95.9% of children, majority of them (77.9%) had less than 5% body surface area involvement. Handa et al<sup>9</sup> reported less than 20% of body surface area involvement in 96.4% and majority of them (86.7%) had less than 5% body surface area involvement.

#### ***Specific features:***

Leukotrichia has been reported in 3.7-4.4% of pediatric patients with vitiligo. Handa et al<sup>9</sup> reported leukotrichia in 12.3% of patients, most commonly in vitiligo vulgaris variant, followed by focal and segmental vitiligo. Our study showed leukotrichia in 41.8% most commonly in vitiligo vulgaris variant, followed by segmental and focal vitiligo.

Kobner phenomenon has been reported to occur in as many as 33% of all vitiligo patients. However, Handa et al<sup>9</sup> reported this figure to be only in 11.3% in pediatric patients. We observed Kobner phenomenon in 24.6% of children, most commonly in vitiligo vulgaris variant. This may be due to increased proneness to trauma and exposure to sunlight.

We observed perilesional pigmentation in 8.5% of children and perifollicular pigmentation in 12.3% of children. These observations have not been made in earlier studies.

#### ***Cutaneous associations and autoimmune disorders:***

Halo naevi are reported to occur in 0.5-14% of vitiligo patients of all age groups<sup>10</sup>. Handa et al<sup>9</sup> reported this in 4.4% of pediatric patients. In our study 4.9% of children had halo naevi.

The reported frequency of associated autoimmune disorders in children with vitiligo is significantly less than that observed in adult vitiligo population. In our study 2.5% had

alopecia areata, out of these one had alopecia universalis. No other autoimmune disorder was observed. Halder et al<sup>5</sup> reported 2 cases of alopecia areata in 82 children with vitiligo, while Handa et al<sup>9</sup> reported 2 cases of alopecia areata and 1 patient each of diabetes mellitus, thyroid disease, Addison's disease, polyglandular syndrome and pemphigus vulgaris in 625 children with vitiligo.

Other cutaneous associations observed in our study were premature canities in 1.6% and cafe au lait macules, naevus depigmentosus and lichen nitidus in 0.8% each.

### ***Ocular associations:***

Depigmentation of the eyelids and poliosis of the eyebrows and eyelashes are commonly seen in vitiligo. The reported frequency of ocular pigmentary abnormalities is 40% in vitiligo patients of all age groups and some loss of visual acuity, poor night vision or photophobia is seen in 5% of these patients<sup>14</sup>. Daniel et al<sup>15</sup> reported 27% of patients with vitiligo of all age groups to have some evidence of retinal pigment epithelium hypo pigmentation and one fourth of these patients had night blindness. Our study found 21.3% with eyelid vitiligo and 1.6% with iris depigmented spots. None of our patients had evidence of retinal pigment epithelium hypo pigmentation or night blindness. This difference might probably suggest that childhood vitiligo patients do not have ocular pigmentary abnormalities in the beginning, but as they age or as the disease progresses they may develop ocular pigmentary changes. Thus frequent ocular examination may be needed to document these changes.

Other ocular associations observed were lamellar cataract and persistent papillary membrane in 0.8% each.

## **Conclusions**

Childhood vitiligo in Bangalore showed preponderance in females probably because patients or parents worry more and tend to seek treatment for cosmetically disfiguring, depigmenting patches more frequently in girls. Majority of patients (77.9%) had less than 5% body surface area involvement. Low incidence of ocular pigmentary abnormalities in comparison with adult population might suggest that childhood vitiligo patients do not have ocular pigmentary abnormalities in the beginning, but as they age or as the disease progresses they may develop ocular pigmentary changes. This study highlights the need for regular follow-up of childhood vitiligo patients to look for associated involvement of the eye.

## References

1. Njoo MD, Westerhof W. Vitiligo: pathogenesis and treatment. *Am J Clin Dermatol* 2002; 2 (3): 167-181.
2. Ortonne JP, Bose SK: Vitiligo: Where do we stand? *Pigment Cell Res* 1993; 6: 61-72.
3. Plettenberg H, Assmann T, Ruzicka T. Childhood Vitiligo and Tacrolimus. *Arch Dermatol* 2003; 139: 651-654.
4. Njoo MD, Bos JD, Westerhof W. Treatment of generalized vitiligo in children with narrow-band (TL-01) UVB radiation therapy. *J Am Acad Dermatol* 2000; 42: 245-253.
5. Halder RM, Grimes PE, Cowan CA, Enterline JA, Chakrabarti SG, Kenney JA Jr. Childhood Vitiligo. *J Am Acad Dermatol* 1987; 16:948-954.
6. Jaishankar TJ, Baruah MC, Garg BR. Vitiligo in children. *Int J Dermatol* 1992; 31:621-623.
7. Porter J, Beuf A, Nordlund J, et al. Psychological reaction to chronic skin disorders. *Gen Hosp Psychiatry* 1979; 1:73-77.
8. Cho S, Kang HC, Hahm JH. Characteristics of vitiligo in Korean children. *Paediatr Dermatol* 2000;17:189-193.
9. Handa S, Dogra S. Epidemiology of childhood vitiligo: a study of 625 patients from North India. *Paediatr dermatol* 2003 May- June; 20(3): 207-210.
10. Handa S, Kaur I. Vitiligo: Clinical findings in 1436 patients. *J Dermatol* 1999; 26:653-657.
11. Mosher DB, Fitzpatrick TB, Ortonne JP, Hori Y. Hypomelanoses and hypermelanoses. In: Freedberg IM, Eisen AZ, Wolff K, Austen KF, Goldsmith LA, Katz SI, et al, editors. *Dermatology in general medicine*. 5 ed. New York: McGraw-Hill; 1999; pg. 945-1017.
12. Dutta AK, Dutta PK. Pigmentary disorders. In Valia RG, Valia AR, Sidappa K Editors. *Assoc. Dermatol. Venereol. Leprol. Textbook and Atlas of Dermatology*. 2<sup>nd</sup> Edition. Bhalani Publishing House. 2001, 607-654.
13. Hann SK, Lee HJ. Segmental Vitiligo: clinical findings in 208 patients. *J Am Acad Dermatol* 1996; 35:671-674.
14. Drake LA, Dinehart SM, Farmer ER, Goltz RW, Graham GF, Hordinsky MH, et al. Guidelines of care for vitiligo. *J Am Acad Dermatol* 1996; 35:620-626.
15. Albert D, Wagoner M, Pruett R, et al. Vitiligo and disorders of the retinal pigment epithelium. *Br. J Ophthalmol.* 1983; 67:153-156.
16. Zhi Hu, Jiang-Bo Liu, Sui-Sui Ma, et al. Profile of childhood vitiligo in China: An analysis of 541 patients. *Pediatric Dermatology*, 23: 114–116.