

SKIN DISORDERS AMONG BLIND AND DEAF MALE STUDENTS IN SOUTHWESTERN SAUDI ARABIA

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Skin disorders are generally considered to be a nuisance, especially among schoolchildren. Though rarely lethal, they can cause much misery and disability. Children with disabilities may be particularly susceptible to skin problems associated either directly to their handicap, or related to the limitations preventing them from undertaking the normal care and/or hygiene of the skin. Such skin problems may add to their disabilities, both physically, due to scratching, itching, and pain, and emotionally, due to embarrassment.¹ The personnel of institutions where such handicapped children usually spend most of their lives may be baffled or disturbed by rashes or lesions affecting these children, particularly if there is the possibility of contagion.

Prevalence studies of skin diseases among schoolchildren in the Asir Region of Southwestern Saudi Arabia have previously been conducted,^{2,3} however, none have been conducted among the handicapped children, either in the region or in the Kingdom at large. The aim of this study was to estimate the prevalence and type of skin disorders among male blind and deaf students in the Asir Region and to compare these prevalence rates with those among normal students.

Patients and Methods

The region of Asir, with a population of approximately 1.2 million, lies in the southwestern area of Saudi Arabia. Abha, the capital city of the region, is in the Asir mountains, 2133 m above sea level. It has the lowest mean annual temperature of any of the southern urban areas and has high annual rainfall, mainly in winter and spring.

Al-Noor Institute for Blind Boys in Abha is the only school for blind males in the Asir Region. It receives both the visually impaired and the blind from the age of 6 years, and according to the criteria of the World Health Organization.⁴ As well, there are two Al-Amal institutes for deaf males in Abha, one for primary students, and the other

provided they do not have any other associated handicapped condition. The students are served medically by the main school health unit in Abha, in addition to a male nurse being permanently available in each institute.

All students at the Al-Noor Institute for Blind Boys (n=75) and the two Al-Amal institutes for the deaf (n=155) in Abha were subjected to thorough dermatological examination as part of a larger survey of such children, performed by one consultant dermatologist to ensure consistency. Examination was done in daylight on students in their underwear, and in allocated classrooms. The diagnosis of skin disease was made mainly on clinical examination. To compare the findings with those in normal students, the results of a study of 647 adolescent male normal students in Abha by the same dermatologist was used.³

Data were analyzed using SPSS software program for cross-tabulation and computation.⁵ Statistical significance for the difference between prevalence rates among blind and deaf students was tested by Z-test, and the 95% confidence interval for the differences was calculated. Pearson chi-squared test was used for comparison of categorical data for both groups, while the Mann-Whitney test was applied to compare numerical data. *P*-value less than 0.05 was considered significant.

FIGURE 1. Prevalence (%) of transmissible and non-transmissible skin disorders among blind, deaf and normal students.

TABLE 1. Distribution of blind and deaf students according to various characteristics.

Characteristics	Blind		Deaf		<i>P</i> -value
	N	(%)	N	(%)	
Age (years)					
6-11	20	27.4	49	32.0	
12-17	37	50.7	91	59.5	
18+	16	21.9	13	8.5	
Total	73	100.0	153	100.0	
X±SD	13.66±3.91		12.3±3.35		0.04*
Onset of handicap					
Born with	65	89.0	117	76.5	
After birth	8	11.0	36	23.5	
Post fever	1	1.1	31	20.3	
Post accident	6	8.2	5	3.2	
Post operation	1	1.4	0	—	
Total	73	100.0	153	100.0	0.03**
Residence					
Institute	62	84.9	70	45.8	
Home	11	15.1	85	54.2	
Total	73	100.0	153	100.0	<0.01**

* Mann-Whitney test was applied; ** Pearson chi-squared test (df=1) was applied.

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Accepted for publication 28 December 1999. Received 19 May 1999.

for intermediate and secondary students. Both institutes receive hearing impaired and deaf students. The institutes for the blind and the deaf receive blind and deaf males,

Results

Table 1 shows the distribution of blind and deaf students according to age, onset of handicap and residence. With respect to age, blind students showed a significantly higher mean age than deaf students (13.66 ± 3.91 vs. 12.69 ± 3.35 years, $P=0.04$). Regarding the onset of the handicap, the study showed that 89% and 76.5% of blind and deaf students, respectively, were born with their handicap (X^2 , $df-1=14.98$, $P=0.03$). On the other hand, 11% of blind and 23.5% of deaf handicaps were acquired after birth, through infection (1.4% and 20%), accident (8.2% and 3.2%) and surgical operation (1.4% and 0.0%), respectively. On residence, about 85% of blind students resided in an institute, compared to only 45.8% of deaf students (X^2 , $df-1=31.23$, $P<0.01$).

Table 2 shows the prevalence of different transmissible skin disorders among blind and deaf students, compared to normal students. Of 73 blind students examined, 21 had one or more transmissible skin disorder, indicating a total prevalence of 28.8%. On the other hand, of 153 deaf students, 31 had such disorders, a prevalence of 20.3%, with no significant difference between the two groups ($P>0.05$). However, the prevalence rate among the blind was significantly higher than that among normal students ($P<0.01$). Folliculitis was significantly more prevalent among the blind (16.5%, $P<0.05$), while verruca vulgaris was significantly more prevalent among the deaf (13.1%, $P<0.01$). Scabies was detected only among blind students (one case), while pediculosis capitis and tinea capitis were detected only among deaf students (one case of each disorder). However, pediculosis capitis was significantly less frequent among the deaf than among normal students ($P<0.01$).

Table 3 shows the prevalence of non-transmissible skin disorders among blind and deaf students. The overall prevalence rates were 82.2% and 86.9% for the blind and the deaf, respectively, with no significant difference ($P>0.05$). However, these prevalences were significantly higher than those among normal students ($P<0.01$). Both groups showed significantly higher prevalences of pityriasis alba, follicular hyperkeratosis and traumatic scars, and significantly lower prevalence of acne vulgaris. Cautery marks were significantly more frequent among the deaf, while intertrigo and skin tags were more prevalent among the blind. Psoriasis was detected only among the blind (1.4%), while alopecia areata, vitiligo and lichen planus, were all detected only among the deaf (0.7% each).

Figure 1 shows a summary of the overall prevalences of transmissible and nontransmissible skin disorders in normal, blind and deaf students.

Discussion

Many studies in developing countries have reported a high prevalence of transmissible skin infections, up to 50%-60% among schoolchildren.^{6,7} The results of the present study revealed the relatively high prevalences of 28.8% and 20.3% among blind and deaf students, respectively. The prevalence among the blind was significantly higher than the 19.8% among normal school students in the same region.³ This high prevalence might be partly attributed to poor personal hygiene among blind children and perhaps partly to their low standard of living, since most blind children in the Asir Region come from the rural areas.

In the study, blind students showed a significantly higher prevalence of folliculitis than deaf ($P<0.05$) and normal students ($P<0.05$). It has been observed by the authors that the blind frequently touch and scratch different parts of their body. Such habits may facilitate bacterial spread, thus creating more folliculitis. Thus, individual lesions may be scratched all over the body, which may lead to infection of other students.

In a previous study, warts were shown to be more prevalent in both blind (9.6%) and deaf (13.1%) students, compared to 3.9% among normal students in the same area,³ with a significantly higher prevalence among the deaf than among normal students ($P<0.01$). As regards parasite infestations, only one case of pediculosis capitis among the deaf and one case of scabies among the blind were detected, compared to a prevalence of 9.6% among normal students ($P<0.01$). However, the fact that these two handicapped groups are isolated probably accounts for the low prevalence.

Very high prevalences of nontransmissible skin disorders were also detected among blind and deaf students (82.3% and 86.9%, respectively; $P>0.05$) as compared to a significantly lower prevalence among normal students (50.2%). Both the nature of the handicaps and the problems of daily living associated with such handicaps must explain these very high prevalences. For example, the extremely high rate of traumatic scars, mostly in the legs, among the blind could be attributed to the difficulty in mobility, as reported by a previous study,⁸ making them more prone to indoor accidents and traumas. For the deaf students,

TABLE 2. Prevalence (%) of transmissible skin disorders among blind and deaf students in comparison to normal students in the Asir region, Southwestern Saudi Arabia.

Type of skin disorder	Normal (n=647)		Blind (n=73)		Z-test	Deaf (n=153)		Z-test
	Prev. (%)	Prev. (%)	% ^a (95%CI) ^b			Prev. (%)	% ^a (95%CI) ^b	
Parasites								
Scabies	–	1.4	1.4 (–1.3:4.1)	1.02	–	–	–	–
Pediculosis capitis	9.6	–	9.6 (7.3:11.9)	8.29**	0.7	8.9 (6.3:11.5)	6.64**	
Fungal								
Tinea capitis	–	–	–	–	0.7	0.7 (–0.6:2.0)	1.04	
Tinea cruris	0.2	–	0.2 (1.4:5.4)	1.14	–	0.2 (–0.1:0.5)	1.14	
Tinea pedis	1.9	5.5	3.6 (1.7:8.9)	1.32	1.3	0.6 (–1.5:2.7)	0.57	
Pityriasis versicolor	–	2.7	2.7 (–1.0:6.4)	1.42	0.7	0.7 (–0.6:2.0)	1.04	
Bacterial								
Folliculitis	6.8	16.4	9.6 (0.9:18.3)	2.16*	5.2	1.6 (–2.4:5.6)	0.78	
Ecthyma	–	1.4	1.4 (–1.3:4.1)	1.02	0.7	0.7 (–0.6:2.0)	1.04	
Erythrasma	–	1.4	1.4 (–1.3:4.1)	1.02	–	–	–	
Viral								
Verruca vulgaris	3.9	9.6	5.7 (–1.2:12.6)	1.61	13.1	9.2 (3.6:14.8)	3.25**	
Herpes simplex	0.5	1.4	0.9 (–1.8:3.6)	0.64	2.0	1.5 (–0.8:3.8)	1.29	
Overall prevalence	19.8	28.8	9.0 (13.7:34.5)	4.53**	20.3	0.5 (–6.6:7.6)	0.14	

^a–Prevalence in normal minus prevalence in blind or in deaf; ^b–95% confidence interval for the difference among normal and blind or deaf; **P*<0.05; ***P*<0.01.

TABLE 3. Prevalence (%) of non-transmissible skin disorders among blind and deaf students in comparison to normal students in Asir Region, Southwestern Saudi Arabia.

Type of skin disorder	Normal (n=647)		Blind (n=73)		Z-test	Deaf (n=153)		Z-test
	Prev. (%)	Prev. (%)	% ^a (95%CI) ^b			Prev. (%)	% ^a (95%CI) ^b	
Pityriasis alba	9.7	21.9	12.2 (2.4:22.0)	2.45*	40.5	30.8 (12.4:29.2)	4.88**	
Follicular hyperkeratosis	8.3	19.2	10.9 (1.6:20.2)	2.30*	29.4	21.1 (13.6:28.6)	5.50**	
Acne vulgaris	56.3	34.2	22.1 (10.6:33.6)	1.01	20.3	36.0 (28.6:43.4)	9.49**	
Atopic eczema	1.7	4.1	2.4 (–2.3:7.1)	3.76**	2.0	0.3 (–2.1:2.7)	0.24	
Cautery marks	8.1	13.7	5.6 (–2.4:13.6)	1.38	19.0	10.9 (4.6:17.2)	3.38**	
Traumatic scars	0.5	40.3	39.8 (28.5:51.1)	6.92**	47.7	47.2 (39.3:55.1)	11.68**	
Psoriasis	0.04	1.4	1.36 (–0.01:0.04)	0.99	–	0.04 (–0.1:0.2)	0.51	
Congenital nevus	–	2.7	2.7 (–1.02:6.42)	1.42	0.7	0.7 (–0.6:2.0)	1.04	
Milia	–	2.7	2.7 (–1.02:6.42)	1.42	–	–	–	
Lichen simplex chronicus	–	2.7	2.7 (–1.02:6.42)	1.42	–	–	–	
Seborrheic dermatitis	–	2.7	2.7 (–1.02:6.42)	1.42	–	–	–	
Intertrigo	–	6.9	6.9 (–1.1:12.7)	2.33*	–	–	–	
Skin tags	–	9.6	9.6 (2.8:16.4)	2.78	–	–	–	
Alopecia areata	–	–	–	–	0.7	0.7 (–0.6:2.0)	1.04	
Lichen planus	–	–	–	–	0.7	0.7 (–0.6:2.0)	1.04	
Vitiligo	–	–	–	–	0.7	0.7 (–0.6:2.0)	1.04	
Overall prevalence	50.2	82.2	32 (22.4:41.6)	6.54**	86.9	(30.1:43.3)	10.91**	

^a–Prevalence in normal minus prevalence in blind or in deaf; ^b–95% confidence interval for the difference among normal and blind or deaf; **P*<0.05; ***P*<0.01.

playing football, which is a common recreation,⁸ must have predisposed them to outdoor accidents and consequent traumas, although the nature of such traumatic scars was not studied in the present study.

Cautery marks, mostly on the trunk, were also prevalent among the blind (13.7%) and the deaf (19%), with a significantly higher prevalence among deaf than among normal students (8.1%, *P*<0.01) This may reflect the customary practice of cauterizing the skin of such handicapped children, especially in the rural areas where most of these children were born, because of the belief that it might cure their conditions.

Both pityriasis alba and hyperkeratosis are associated with atopy, although the findings of atopic stigmata or the prevalence of atopic symptoms were not investigated in

the present study. Pityriasis alba was significantly more prevalent among the deaf (40.5%) and blind (21.9%), compared to normal students (9.7%, *P*<0.01). The fact that it was more frequent among the deaf than the blind (*P*<0.01) could be attributed to the frequent exposure of deaf students (usually when they are outdoors playing football) either to sunlight or to the cold winter winds that characterize the Asir Region, leading to the excessively dry skin which is a predisposition of such conditions.

Follicular hyperkeratosis was more prevalent in both blind (19.2%) and deaf (29.4%) students compared to normal students (*P*<0.01). Such a condition is a characteristic of people living in the highlands,⁹ as it protects the skin against excessive exposure to ultraviolet radiation.

Intertrigo was only noted among blind students, at a relatively high prevalence of 6.9%, mostly because such students are more overweight than deaf students, probably due to their limited mobility and smaller amount of physical activity. As well, skin tags that are congenital in origin were prevalent in blind students (9.65%), probably being associated with the syndrome or disorder that explains the etiology of the blindness. However, the different congenital disabilities associated with blindness were not investigated in the present study, on the assumption that both institutes for the blind and the deaf accept students only if they are free from any associated disabilities.

In conclusion, the relatively high prevalence of transmissible skin disorders among the blind reflects poor personal hygiene on the part of these handicapped students. There is a need for more supervision and care by the personnel who look after these students. The high prevalence of nontransmissible skin disorders among both deaf and blind students could be attributed to the nature of their handicaps and the associated problems of daily living.

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