

Squint in Children and Adolescents, Arar, Northern Saudi Arabia

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ABSTRACT

Background: Squint, crossed eyes and deviating eyes is a condition in which the eyes do not properly align with each other when looking at an object. A child with squint may stop using the affected eye. This can lead to visual loss called amblyopia, which can become permanent unless treated early in childhood. The **aim** of the study was to estimate the prevalence of squint, some determinants and clinical manifestations and treatment characteristics in the studied children and adolescents in Arar, Northern Saudi Arabia. This was a cross-sectional study, conducted in Arar, Northern Saudi Arabia. The study included 156 randomly selected participants (62 male and 94 female children and adolescents).

Results: This study reported squint in 14.7% of the studied sample, 26.1% were females and 73.9% were males. There was no significant relation between squint and age, other hereditary diseases or other chronic diseases but there was relation with consanguinity between parents ($P=0.03$). The cause of squint was eye trauma in 17.4%, surgical operation in 4.3% and neurological disease in 4.3%. Squint was right sided in 47.8% of cases, left sided in 34.8% and in both eyes in 17.4% of the studied cases. 78.3% of the cases had inward squint and 17.4% outward squint. In 8.7% of the cases squint alternate between eyes. Temporary squint found in 52.2% and 78.3% of squint cases use glasses. In all cases squint affect visual acuity. All cases received treatment (69.9% medical and 30.4% surgical) but only 52.2% cured and 43.5% had recurrence. **Conclusion:** This study reported squint in 14.7% of the studied sample, 73.9% were males. There was significant with sex and consanguinity between parents ($P=0.03$). The etiology was eye trauma, eye surgical operation and neurological disease. Large scale screening studies is mandatory. Health education of the public about causes and importance of early treatment is important

Keywords: Squint; strabismus; prevalence; causes; Arar; Saudi Arabia.

INTRODUCTION

Strabismus is the medical term for an eye condition commonly called by various names: Squint, crossed eyes, walleys, wandering eyes, goggle eyes and deviating eyes ^[1]. It is a condition in which, the eyes do not properly align with each other when looking at an object ^[2]. A child with a squint may stop using the affected eye. This can lead to visual loss called amblyopia, which can become permanent unless treated early in childhood. This treatment usually involves patching the good eye, to force the use of the affected eye. Sometimes surgery is needed to correct the appearance of a squint ^[3]. Strabismus may lead to a failure to develop binocular vision, and amblyopia, either of which may prevent an individual pursuing certain occupations. The appearance of ocular misalignment may interfere with social and psychological development with potentially serious effects for all patients with strabismus ^[4-6]. Symptoms of strabismus include double vision

or eye strain. To avoid double vision, the brain may adapt by ignoring one eye. In this case, often no noticeable symptoms are seen other than a minor loss of depth perception.

It is estimated that 4% of children suffer from strabismus. It is a public health problem for which all actors must be mobilized ^[7]. The frequency of strabismus is between 0.99 and 2.6% in Europe. Matsuo, estimated it at 1.26% in 2003 and 0.99% in 2005 ^[8].

A previous study in KSA ^[9] reviewed the files of 385 children, with a male/female ratio of 1.1:1.0. The group aged 0–6 years made up the largest group ($P = 0.01$). Strabismus was prevalent with a percentage of (36.9%).

Another study conducted in Ilorin, Kwara State, Nigeria ^[10] reported that; a total of 7,288 children were screened (3766 boys and 3522 girls). This yielded 32 cases of strabismus (19 males and 13 females). Their age ranged from two to sixteen years old (mean, 9.5 + or - 6.0 years). The aim of the study was to estimate the

prevalence of squint, some determinants and clinical manifestations and treatment characteristics in the studied children and adolescents in Arar, Northern Saudi Arabia.

METHODS

A cross-sectional study conducted in Northern Saudi Arabia. The study included 156 participants (62 male and 94 female children and adolescents from 6 months to 19 years old). The study period was from 1st January to 30th July 2017. A systematic random sampling technique was used; we included children and adolescents of every 10th family. Data collection: by personal interview using a pre-designed questionnaire, which were distributed among mothers of children and adolescents to be self-reported. The questionnaire had brief introduction or explanation of the idea of the research to children mothers. Mothers filled out the predesigned questionnaire to collect demographic and socioeconomic data including:

- Socio-demographic characteristics of the participants including age, sex and educational status
- If the patient has squint or other hereditary diseases
- Questions about squint (cause, type, duration, side, treatment and recurrence of squint)

Statistical analysis

Collected data was coded and analyzed using statistical package for the social sciences (SPSS, version 15). Descriptive statistics for the prevalence and quantitative variables were used. Relation between squint and sociodemographic characters was determined using A 2-sided p-value of less than 0 .05 was considered statistically significant.

Ethical considerations

This study was reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Northern Border University. Participants were informed that participation is completely voluntary and data collectors introduced and explained the research to participants. No names were recorded on the questionnaires and all questionnaires were kept safe.

RESULTS

Table (1): illustrates the Socio-demographic characteristics, percentage of squint, other hereditary diseases, consanguinity between

parents, and presence of other chronic diseases among the studied children and adolescents. The table showed that 58.3% of the studied children aged between 7-19 years, 28.2% between 1-7 years and 12.8% aged less than one year. Male to female ratio was 39.7 to 60.7. Primary education constitutes 41%, 12.2% had preparatory education, 17.9% had secondary education, and 20.5% were illiterate. As regard; consanguinity between parents was found in 37.2% of the studied children. Squint was positive in 14.7% of the studied sample. Only 1.9 of children had other hereditary disease and 7.1% had other chronic disease.

Table (1): Socio-demographic characteristics, percentage of squint, other hereditary diseases, consanguinity between parents, and presence of other chronic diseases among the studied children and adolescents, Arar, 2017

Variable	No. (n=156)	%
Sex		
Female	94	60.3
Male	62	39.7
Age		
< 1	20	12.8
1-7	44	28.2
7-19	91	58.3
Educational status		
Primary	64	41.0
Secondary	28	17.9
Preparatory	19	12.2
Others	13	8.3
Illiterate	32	20.5
Squint		
Yes	23	14.7
No	133	85.3
Other hereditary diseases		
No	153	98.1
Yes	3	1.9
Consanguinity between parents		
No	98	62.8
Yes	58	37.2
Chronic diseases		
No	145	92.9
Yes	11	7.1

Table (2): illustrate the relationship between squint and sex, hereditary diseases, consanguinity between parents and presence of the chronic diseases in the studied children and adolescents. There was no significant correlation between

squint and (age, other hereditary diseases or other chronic diseases) but there was relation with sex (P=0.000) and consanguinity between parents (P=0.03).

Table (2): The relationship between squint and sex, hereditary diseases, consanguinity between parents and presence of the chronic diseases in the studied children and adolescents, Arar, 2017

Variables	Squint		Total (n=156)	P value	
	Yes (n=23)	No (n=133)			
Age (in years)	< 1	5	15	20	0.493
		21.70%	11.30%	12.80%	
	1-7	7	37	44	
	30.40%	27.80%	28.20%		
7-19	11	80	91		
	47.80%	60.20%	58.30%		
Sex					
Female	6	88	94	0.001	
	26.10%	66.20%	60.30%		
Male	17	45	62		
	73.90%	33.80%	39.70%		
Hereditary diseases					
No	21	132	153	0.057	
	91.30%	99.20%	98.10%		
Yes	2	1	3		
	8.70%	0.80%	1.90%		
Consanguinity between parents					
No	8	90	98	0.003	
	34.80%	67.70%	62.80%		
Yes	15	43	58		
	65.20%	32.30%	37.20%		
Other chronic diseases					
No	19	126	145	0.059	
	82.60%	94.70%	92.90%		
Yes	4	7	11		
	17.40%	5.30%	7.10%		

Table (3): illustrate squint clinical manifestations and treatment in the studied children and adolescents. Squint in parents was prevalent with a percent of 13%. Squint since birth was 13%. Regarding the cause of squint; eye trauma was 17.4%, surgical operation 4.3% and 4.3% due to neurological disease. Squint was right sided in 47.8% of the cases, left sided in 34.8% and in both eyes in 17.4% of the studied cases. 78.3% of cases had inward squint and 17.4% outward squint. 8.7% of the cases had alteration between eyes. 56.5% of the cases responded yes to temporary squint and 52.2% responded yes to permanent squint. 78.3% of squint cases use glasses.

All cases reported squint affect visual acuity but in 87% squint affect the psychological state. All cases received treatment (69.9% medical and 30.4% surgical) but only 52.2% were cured and 43.5% had recurrence.

Table (3): Squint clinical manifestations and treatment characteristics in the studied children and adolescents, Arar, 2017

Variable	Frequency (n=23)	Percent
Squint in parents	3	13.0
Squint since birth	3	13.0
Squint caused by eye trauma	4	17.4
Squint caused by surgical operation	1	4.3
Squint due to neurological disease	1	4.3
Site of squint		
Left eye	8	34.8
Right eye	11	47.8
Both eyes	4	17.4
Type of squint		
Outward squint	4	17.4
inward squint	18	78.3
Alternate between eyes	2	8.7
Temporary squint	13	56.5
Permanent squint	12	52.2
Glasses	18	78.3
Squint affect visual acuity	23	100.0
Affect the psychological condition	20	87.0
Treatment characteristics		
Asking medical care	23	100.0
Medical treatment		69.6
Surgical treatment	7	30.4
Success of treatment	12	52.2
Recurrence of squint after treatment	10	43.5
Side effect of treatment	1	4.3

DISCUSSION

The medical name for squint is strabismus. It is a condition where the two eyes do not look in the same direction. Whilst one eye looks forwards to focus on an object, the other eye turns inward, outward, upward or downwards.

Most squints occur in young children. Strabismus is a common condition in childhood affecting 2.1% of the population ^[11], with an increased prevalence associated with assisted delivery (forceps or caesarean section), low birth weight (including premature infants), neurodevelopment disorders. Neurodevelopment strabismus (associated with a neurodevelopment problem) is independently associated with maternal smoking later in pregnancy, maternal illnesses in pregnancy and low birth weight for gestational age ^[3].

The aim of the study was to estimate the prevalence of squint, some determinants and clinical manifestations and treatment characteristics in the studied children and adolescents in Arar, Northern Saudi Arabia. This was a cross-sectional study, conducted in Arar, Northern Saudi Arabia. The study included 156 randomly selected participants (62 male and 94 female children and adolescents).

This study reported squint in 14.7% of the studied sample, 26.1% was female and 73.9% was male. In a retrospective review of all patients less than 18 years of age who presented to the pediatric ophthalmology clinic of Prince Mohammed Bin Nasser Hospital (PMNH), Iason, among 385 files of children, Strabismus was the most common disorder seen (36.9%) ^[12]. The prevalence of strabismus worldwide was reported to vary from 1.3% to 5.7% of all children ^[13]. Another study carried out on primary school pupils in Benin City, Nigeria, found the prevalence of strabismus was 0.89%; females were more affected than males ^[14]. The overall prevalence of strabismus in Young Singaporean Chinese Children aged 6 to 72 months was 0.80%, there was no difference in strabismus prevalence between the boys and the girls, and there were no age trends ^[15]. It was lower than in children aged between 4 and 7 years in the United States, United Kingdom, and Australia where the reported prevalence has ranged from 2.3% to 3.4% ^[16, 17, 18]. The prevalence of strabismus in children and adolescents in Germany was estimated to be 4.1%, Boys had a slightly lower prevalence (3.7%) compared to girls (4.4%) ^[19]. A cross sectional survey was carried out among primary school children in Ilorin South Local Government Area in Nigeria, among 7,288 children were screened (3766 boys and 3522 girls), this yielded 32 cases of strabismus (19 males and 13 females). Their age ranged from two to sixteen years ^[20].

In this study regarding to types of squint, 78.3% of cases had inward squint and, 17.4% outward squint, 8.7% of the cases had alteration between eyes. Among 4,886 strabismus patients who underwent surgery at the King Khalid Eye Specialist Hospital in Riyadh, Saudi Arabia, esotropia (inward squint) was the most common type of strabismus (69.3%), while exotropia (outward squint) was less common (26.9%) ^[21]. Another study showed the prevalence of esotropia was 0.14%, and that of exotropia 0.14% ^[22]. Esotropia comprises approximately 60% of all strabismus in the West ^[23]. In Khartoum, Taha and al. in a study about horizontal strabismus found that exotropia was the predominant type with 2.2%, while exotropia was 0.4% ^[23].

CONCLUSION AND RECOMMENDATIONS

This study reported squint in 14.7% of the studied sample, 73.9% were males. There was significant with sex and consanguinity between parents ($P=0.03$). The etiology was eye trauma, eye surgical operation and neurological disease. Large scale screening studies is mandatory. Health education of the public about causes and importance of early treatment is important.

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