



THE USE OF BOTOX INJECTION IN THE TREATMENT OF STRABISMUS IN SAUDI CHILDREN

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Abstract:

Strabismus is a disease that affects people, particularly children, and impacts the quality of their lives. The present study aimed to study the outcomes of injecting Botox to treat strabismus in a group of Saudi children. The study sample included 99 children with strabismus. Working Excel sheets were used to collect data from files of patients. Data included age, gender, injection protocols, and outcomes of treatment after 6 months. The data analysis was conducted using SPSS version 21. Descriptive statistics including mean, standard deviation, frequency, and percentages were used to express the status of each variable. The findings of this study showed that the mean age of patients was 8.37 ± 5.92 years, and females were more prevalent than males (58.6%). The angular vision was reduced after 6 months of Botox injection. Taken together, the use of Botox injection has safe margins and therapeutic potential for the treatment of strabismus.

Keywords: Strabismus, Botox, injection, angular vision, treatment

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INTRODUCTION:

Strabismus, sometimes known as a squint, is an eye disorder in which the eyes are not properly aligned (1). Strabismus affects 2.1% of children in the United Kingdom (2). Some of the many reasons for strabismus in children are rather dangerous, endangering not only the eyes but potentially the child's life (3). Therefore, correct diagnosis and treatment of strabismus must be carried out without delay (4). Both strabismus and amblyopia are prevalent, and amblyopia can be a cause or a consequence of strabismus. To prevent a long-term loss of vision, it is critical to diagnose and treat amblyopia as soon as possible (5).

A notable discrepancy exists in the incidence rates of different subtypes of strabismus across diverse ethnic populations (6). A few Western nations, including Sweden, Australia (7), and Non-Hispanic White Americans, have an abnormally high incidence of esotropia (8). However, in terms of subtypes of strabismus, exotropia is more prevalent in Asian nations (9). A multitude of genetic and environmental factors have been associated with strabismus (10). Anisometropia, intraventricular hemorrhage, cerebral palsy, and maternal cigarette consumption during pregnancy are some of these risks (11).

After an American cryotherapy multicenter experiment indicated that treated threshold for retinopathy of prematurity(ROP) eyes had a better prognosis than untreated eyes, screening, and treatment were implemented in the 1980s (12).The treatment parameters and delivery methods have altered, with antivascular endothelial growth factor injections becoming

more prevalent and laser therapy replacing cryotherapy (13).Studies showed that prematurely born infants treated for ROP had a higher rate of refractive errors, strabismus, and visual impairments than those without ROP (14).

STUDY OBJECTIVES:

The present study aimed to seek the outcomes of treating children with strabismus in Saudi Arabia.

Subjects and methods

The present study included 99 patients with strabismus. Using working Excel data sheets, data of participants were collected. Data included some demographic variables such as age and gender. Data included strabismus-related factors such as pre-injection angles of extraocular muscle and internal muscles of the eye. The outcome of angular vision after 6 months was also included in the data. Statistical analysis was conducted using SPSS version 21. Continuous variables were described using mean and standard deviation, whereas categorical variables were described using frequencies and percentages. Plotting figures were used to explore age, gender and angular vision for pre-injection and after 6 months.

RESULTS:

General characteristics of study participants

As indicated in Table (1), the average age of the individuals in the dataset is 8.37 years, with a standard deviation of 5.92 years. The table presents the distribution of gender within the data. There are a total of 99 individuals, with 41.4% being male and 58.6% being female.

Table 1: General characteristics of study participants

Variable	Description
Age (M±SD) years	
Gender (N, %):	
- Male	41 (41.4%)
- Female	58 (58.6%)

Pre-injection angles of external and internal muscles

As shown in Table (2), the angular vision varied

from 16 to 120 degrees by the internal muscles of the eye. On the other hand, the angular vision varied from 18 to 75 degrees by the extraocular muscle of the eye.

Table 2: pre-injection angles of external and internal muscles

Variable	Frequency (N)	Percent (%)
ET 120	1	1.0
ET 16	2	2.0
ET 18	1	1.0
ET 20	6	6.1
ET 25	6	6.1
ET 30	6	6.1
ET 35	11	11.1
ET 40	11	11.1
ET 45	11	11.1
ET 50	6	6.1
ET 55	3	3.0
ET 60	2	2.0
ET 65	2	2.0
ET 70	2	2.0
ET 80	2	2.0
residual	1	1.0
XT 18	1	1.0
XT 25	1	1.0
XT 30	5	5.1
XT 35	6	6.1
XT40	2	2.0
XT 45	4	4.0
XT 50	4	4.0
XT 60	1	1.0
XT 65	1	1.0
XT 75	1	1.0
Total	99	100.0

The Plotting figure of gender, age, and pre-injection

As shown in Figure 1, males had larger angular vision by extraocular muscle of the eye up to 75

degrees. On the other hand, the maximal degree of external muscles of the eye reached 60 degrees, and the lowest degree was 20 by internal muscles of the eye.

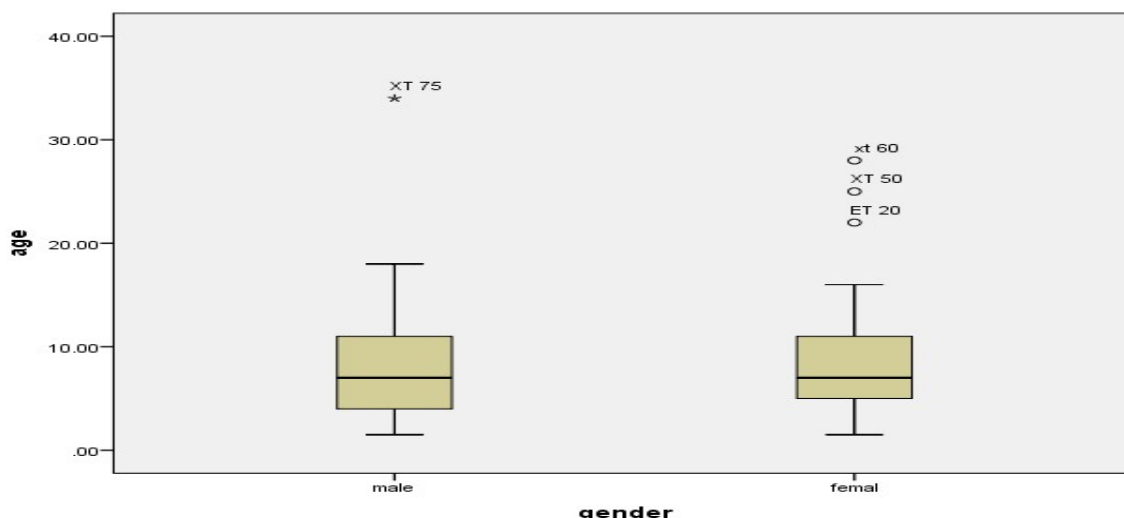


Figure 1: Plotting figure of gender, age, and pre-injection Outcome of angular vision after 6 months

After 6 months of injection with varying doses of Botox, angular vision by the internal muscles of the eyes varied from 10-40 degrees, whereas the angular vision of extraocular muscle of the eyes varied from 8-40 degrees.

Table 3: Outcome of angular vision after 6 months

Variable	Frequency (N)	Percent (%)
Valid	7	7.1
cons. XT 15	1	1.0
ET 10	4	4.0
ET 12	4	4.0
ET 15	9	9.1
ET 15-20	1	1.0
ET 16	6	6.1
ET 20	7	7.1
ET 25	4	4.0
ET 35	1	1.0
ET 40	3	3.0
ET15	1	1.0
od et	1	1.0
ORTHO	3	3.0
ORTHO	24	24.2
XT 10	7	7.1
XT 15	7	7.1
XT 20	2	2.0
XT 25	3	3.0
XT 40	2	2.0
XT 8	2	2.0
Total	99	100.0

The plotting figure of the age, gender, and angular vision after 6 months of injection with Botox

As shown in Figure (2), females had larger angular vision by extraocular muscle of the eye up to 40 degrees.

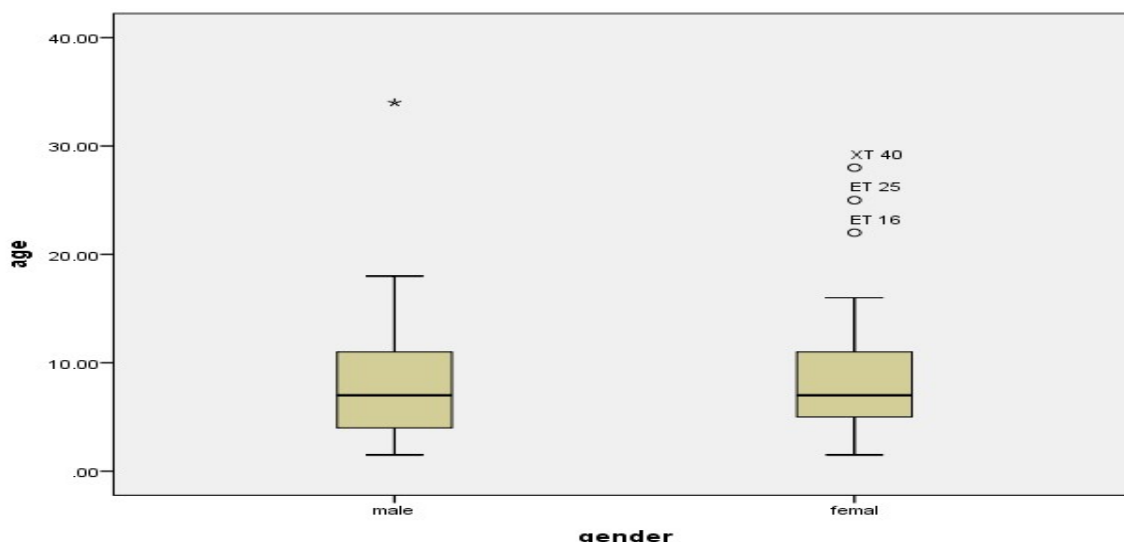


Figure 2: The plotting figure of age, gender, and angular vision after 6 months of injection with Botox.

DISCUSSION

The purpose of this study was to explore the beneficial effects of using Botox in treating strabismus among children in Saudi Arabia. The use of Botox in treating diseases has been indicated for a long time (Scott et al., 2023). Several studies have reported its use in the treatment of strabismus (15, 16).

The results of the present study showed that the treatment with Botox had good outcomes for the vision of patients with strabismus, and the angular vision after 6 months became more centric. This is in line with other studies that reported the injection of Botox into the

extraocular muscle, which thereafter causes local paralysis, is a widely accepted and effective treatment for adult strabismus (16, 17). The initial Cochrane systematic examination of outcomes following BTXA for strabismus found that BTXA injection was just as effective as surgery in treating residual esotropia in children (16, 18). Previous studies have shown that the use of Botox injection reduced the angle of deviation (19).

CONCLUSION

The use of Botox injection in the treatment of strabismus seems effective and safe.

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