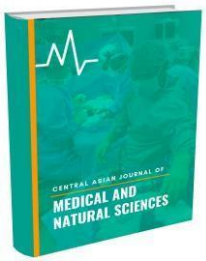

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Article

Disparities in Gender and Postponement in the Manifestation of Pediatric Strabismus

Wisam Mohammed ali Majeed

1. MB.CH.B. C.A.B. of Health Sciences (Ophthalmology). Ahlu – Albait University Departement of Optometry
* Correspondence: wmam737373@gmail.com

Abstract: The primary aim of this research study was to meticulously evaluate and analyze the variances in gender-related differences as well as the delays in the presentation of childhood squint conditions within the context of a tertiary care hospital environment. This investigation was conducted through a comprehensive assessment of a cohort of pediatric patients who were diagnosed with squint and subsequently presented for medical attention at the Al hussain medical city in Karbala, Iraq,. We undertook a retrospective examination of the pertinent clinical cases that were recorded during the time frame spanning from February 2010 to July 2017, thereby allowing us to gather extensive data for our analysis. A study involving 214 children with squint found that 52.4% were female. Boys presented for treatment earlier, at an average age of 3 years and 5 months, compared to girls at 4 years and 5 months, with a significant p-value of less than 0.05. Girls also had longer delays in seeking treatment, with a median delay of 2 years and 3 months, while boys had a median delay of 1 year and 3 months. Amblyopia was observed in 25.3% of the children, with girls showing a higher, though not statistically significant, prevalence (P-value 0.09). In summary, our study revealed a significant gender disparity in the age at which children present with squint conditions, highlighting the need for further investigation into the underlying factors contributing to this phenomenon in our patient population.

Keywords: Pediatric Strabismus, Gender Disparities, Amblyopia Prevalence, Delay in Presentation, Squint Treatment

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1. Introduction

Childhood squint, clinically recognized as strabismus, represents a frequently encountered ophthalmic condition that affects the alignment of the eyes during the formative years of development. If this condition remains unaddressed and untreated, it can lead to the development of amblyopia, commonly referred to as "lazy eye," which may result in irreversible visual impairment and a permanent loss of vision capabilities that are critical for proper visual functioning. Various research studies have indicated that the prevalence of amblyopia among children diagnosed with esotropia can reach alarming rates, with estimates as high as 50%, while those with exotropia exhibit a lesser yet significant prevalence of approximately 20%. [1] , [2] . The therapeutic approach to managing squint typically encompasses the correction of any underlying refractive errors

that may exacerbate the condition alongside occlusion therapy designed to enhance visual acuity, and in certain instances, surgical intervention may become necessary to align the ocular muscles appropriately. Despite the critical significance of early detection and proactive intervention in mitigating the adverse effects of squint, it is noteworthy that children residing in developing nations frequently present at a later stage of the condition's progression. For instance, a particular study conducted in the Al hussain medical city in Karbala ,Iraq , revealed that a considerable proportion of children diagnosed with squint were presenting at an age exceeding five years [3], which highlights a concerning delay in seeking appropriate medical care. This scenario stands in stark contrast to findings from numerous studies conducted in Western countries, where the average age at which children present for treatment ranges from as early as two years to five year [1], [4], [5] thus underscoring a significant disparity in healthcare access and utilization. Furthermore, the issue of gender bias in healthcare has been extensively documented and analyzed in various scholarly works. Investigations into healthcare utilization patterns in developing countries strongly suggest that gender discrimination remains a pervasive problem impacting the health and well-being of children particularly in the context of accessing essential ophthalmic care.

2. Materials and Methods

This study constituted a comprehensive retrospective case series that meticulously examined a cohort of pediatric patients who presented with the condition commonly referred to as squint, during the specific time frame extending from February 2010 to July 2017 in Al hussain medical city in Karbala ,Iraq . In our analysis, we systematically included all cases that had been diagnosed with childhood squint, while explicitly excluding those individuals who had a documented history of undergoing squint surgical interventions in the past, as well as those whose squint was suspected to be secondary to external trauma or neurological deficits such as nerve palsy. Utilizing detailed medical records, we undertook a thorough collection of pertinent data encompassing various demographic variables, including the age at which the child presented, any delays in the timing of their presentation, the specific type of squint exhibited, and whether or not the child had been diagnosed with amblyopia, in addition to data regarding their refraction and birth weight. For the purposes of our study, we adhered to established definitions and classifications for both squint and amblyopia, ensuring that our findings would be grounded in widely accepted medical terminology and understanding. The assessment of age at presentation was determined based on the child's current age at the point of their attendance at the clinic for evaluation and treatment [6]. Moreover, we defined the delay in presentation as the elapsed time interval that transpired between the initial onset of squint symptoms and the subsequent presentation of the patient at the clinic for professional medical attention.

3. Results

Between the years spanning from 2010 to 2017, a total of two hundred and fourteen pediatric patients exhibiting symptoms indicative of strabismus, commonly referred to as squint, made their way to our specialized clinic for evaluation and management of their condition. Among this cohort, a closer examination revealed that a total of 104 individuals, which constitutes approximately 48.6 percent of the total sample, were identified as male, while the remaining 110 , accounting for around 52.4 percent, were classified as female, as illustrated in the accompanying table. Upon analyzing the demographic data, it was determined that the average age of these children at the time of their initial presentation to our clinic was approximately three years and eleven months, with a standard deviation of two years, as depicted in the corresponding figure. Furthermore, a statistically significant disparity was identified when comparing the mean ages at presentation

between the male and female cohorts, demonstrating that boys presented at an average age of three years and five months, whereas girls presented significantly later at an average age of four years and five months, with a p-value of less than 0.05 indicating a meaningful difference. In addition to this, the median age, inclusive of the range of ages, for the female patients was observed to be higher than that of their male counterparts, with girls presenting at a median age of four years, with a range spanning from six months to twelve years, in contrast to boys who had a median age of three years, encompassing a range from six months to fourteen years. It is noteworthy that we were able to obtain data concerning the interval between the onset of squint symptoms and the subsequent presentation to our clinic for a subset of 124 cases; an analysis of this data revealed that female patients experienced a longer mean and median delay in seeking treatment compared to male patients, with the mean delay for girls recorded at two years and four months, accompanied by a standard deviation of three years, juxtaposed with a mean delay for boys of three years and a standard deviation of two years and eight months. Additionally, the median delays further elucidate this finding, as girls exhibited a median delay of two years and three months, with a range from one month to twelve years, whereas boys only had a median delay of one year and three months, with a range extending from one month to fourteen years. This comprehensive analysis underscores the need for heightened awareness and timely intervention strategies to address the challenges associated with squint in pediatric populations.

In a comprehensive examination of the prevalence of amblyopia among the pediatric population presenting with squint, it was determined that amblyopia was evident in a notable 25.3% of the cohort, specifically manifesting in 46 out of a total of 182 children diagnosed with this ocular misalignment. Notably, when analyzing the data by gender, it became apparent that female children exhibited a significantly higher prevalence of amblyopia, with 30.9% of the girls, totaling 34 out of 110, being affected in contrast to only 17.3% of the boys, equating to 18 out of 104, although it is important to mention that this difference did not reach statistical significance,

as indicated by a P-value of 0.09. Furthermore, a deeper dive into the data revealed that among the subset of children diagnosed with unilateral squint, a striking 63.6%, which corresponds to 28 out of 44 children, were found to have concomitant amblyopia, in sharp contrast to just 13.0%, or 18 out of 138 children, who presented with alternating squint without amblyopic involvement

When categorizing the types of squint observed in this study, it was found that convergent squint emerged as the predominant form, being present in an overwhelming 63.6% of the total cases, specifically noted in 68 out of 107 children examined. Additionally, the study identified that 15 children were diagnosed with pseudo squint, a condition often mistaken for true squint due to its deceptive appearance. Upon further analysis of the remaining 92 children, it was determined that a considerable 76.1% exhibited alternating squint, while the remaining 23.9% were classified as having either unilateral or constant squint, as detailed in Table 1. Moreover, the findings indicated that an impressive 168children, translating to 91.3% of the total population assessed, were diagnosed with tropia, whereas a smaller subset, consisting of 16 children or 9.7%, presented with phoria. In terms of classification of the types of squint observed, alternating esotropia was identified as the most prevalent form, followed closely by alternating exotropia.

It is worth noting that comprehensive data pertaining to the refraction status of the participants were successfully obtained for 180 out of the 204 patients included in this study. Interestingly, it was observed that a significant majority of the children who were diagnosed with convergent squint, specifically 84 out of 112, which constitutes 75.0% of this subgroup, were found to have hypermetropia, thus highlighting a potential correlation between refractive error and the development of this particular type of squint.

Table (1): Demographic and clinical attributes of pediatric populations.

		Frequency	Gender		Total number
			Male(n=104)	Female(n=110)	
Type of squint	Divergent	48	20	28	204
	Convergent	136	72	64	
	Pseudo squint	30	12	18	184
	Constant	44	12	32	
	Alternating	140	80	60	
Manifest/latent	Tropia	168	86	82	184
	Phoria	16	6	10	
Family history*	Yes	22	10	12	83
	No	144	62	82	
***Information regarding first degree family history was available in only 166 cases.**					

4. Discussion

Our comprehensive examination and analysis elucidated the striking finding that female children diagnosed with strabismus, commonly referred to as squint, tend to present themselves to medical professionals at a significantly later stage in comparison to their male peers, thereby highlighting a notable gender disparity in the timing of diagnosis. Furthermore, our research indicated that these girls exhibited a markedly higher incidence of amblyopia, a condition characterized by reduced vision in one eye, which may suggest a correlation between gender and the severity of visual impairments. This observable difference in presentation times could potentially be attributed to the prevailing societal norms and cultural attitudes that exhibit a preference for boys over girls, thereby influencing the likelihood of early recognition and intervention. It is also noteworthy that female patients often seek medical attention only when there is a pronounced and noticeable deviation in ocular alignment, which can lead to social stigma and psychological distress, motivating them to pursue treatment. In contrast, a relevant study conducted in the United States presented findings that indicated no discernible difference in the age at which children are diagnosed with intermittent exotropia, suggesting that cultural contexts may play a significant role in these disparities [7]. However, there exists a notable scarcity of scholarly literature that addresses the specific gender differences and the associated delays in the presentation of childhood squint, leaving a gap in our understanding of this phenomenon. A review of some previously reported studies indicates that there is substantial variability in the age at which patients present, a variance that may be elucidated by factors such as socioeconomic status and the behaviors associated with seeking healthcare. Moreover, it is interesting to note that the average age at which patients seek medical attention for this condition has been documented to range from two and a half years to five years, as evidenced by studies conducted in the United Kingdom and Singapore. The findings of our own study align closely with this established range, reinforcing the notion that the age of presentation for childhood squint remains relatively consistent across diverse geographical contexts. Overall, these insights underscore the complexities surrounding gender, societal influences, and health-seeking behavior in the realm of pediatric ophthalmology.

One particularly noteworthy and compelling discovery that emerged from our comprehensive study was the alarming observation that there exists a substantial and concerning delay in the presentation of individuals suffering from squint, with a median delay time calculated to be approximately two years. This significant postponement in seeking treatment may potentially stem from a widespread lack of awareness among the general populace regarding the condition of squint, its associated symptoms, and the variety of treatment options available, or it could also be attributed to deficiencies in the existing health referral systems, compounded by a scarcity of adequately trained healthcare professionals and eye care services in the region. The critical importance of early diagnosis and subsequent treatment cannot be overstated, as these factors play a pivotal role in the prevention of amblyopia and the myriad of complications that can arise as a result of untreated squint.. The presence of squint can severely impair visual acuity, which, in turn, can have detrimental effects on a child's overall performance in academic settings, participation in sports, and engagement in various other recreational activities. It is worth noting that a significant proportion of squint cases are linked to underlying refractive errors, and the early correction of these refractive issues has been shown to be advantageous in numerous instances. In the findings of our study, we observed a notably higher prevalence of amblyopia among female participants compared to their male counterparts. This observation stands in stark contrast to a previous study conducted in the United Kingdom, which indicated that a greater number of boys, in comparison to girls, were identified as presenting with strabismic amblyopia. Furthermore, the aforementioned study revealed that boys were significantly older at the time of presentation, with a median age of 4.93 years, compared to the median age of 4.15 years for girls, which yielded a statistically significant p-value of 0.016. [7].

Our research investigation encountered several notable limitations that must be acknowledged in order to lend a comprehensive understanding of the findings. To begin with, the study was conducted within the confines of a single medical center, which inherently raises concerns regarding the generalize ability of the results, as it may not accurately reflect the broader population demographics or variations; thus, caution should be exercised when attempting to apply these findings to a wider cohort. In light of this, it is imperative that additional studies be conducted within public sector environments to validate and potentially expand upon the insights gained from our investigation. Furthermore, it is crucial to note that the data pertaining to the age at which squint symptoms first manifested was derived from the recollections provided by either the patients themselves or their parents, introducing an element of potential recall bias that cannot be entirely discounted or eliminated from our analysis. Such bias could significantly impact the accuracy of the reported age of onset, leading to discrepancies that might skew the overall results of the study. Therefore, it is essential for future researchers to implement more objective measures of data collection to mitigate the effects of such biases and enhance the reliability of their findings.

5. Conclusion

In the context of our comprehensive study, we observed a notable and statistically significant disparity between genders concerning the age at which individuals presented with childhood strabismus, commonly referred to as squint. Given the implications of this finding, it is thus imperative that further investigative research is undertaken to delve deeper into the underlying factors and potential reasons contributing to this pronounced gender difference, as well as the observed delay in the age of presentation associated with this condition. Such future inquiries could considerably enhance our understanding of the phenomenon and ultimately inform clinical practices and interventions aimed at addressing these disparities in a more effective manner.

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