

## Quality of Life and Strabismus Surgery in Children

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Clinicians often make a personal assessment of how much quality of life (QoL) improves after treating a patient. Objective evaluation of QoL, therefore, can help clinicians make educated decisions on managing their patients. The popularity of measuring QoL using standard instruments is sharply increasing. One important reason for such a trend is that some medical interventions produce little, if any, benefit for the treated patient. In some cases, treatment may even diminish QoL.<sup>[1]</sup> The principal goal of any medical intervention is to assist patients who have sustained a disease state or disability. The disability caused by illness or injury is deemed multi-dimensional and is directly related to how the patient interacts with his/her physical, social, and attitudinal environment.<sup>[2]</sup> Hence, validated information on objective changes in QoL after any treatment serves as an accurate and reliable method to assess the harm and benefit of any medical intervention. The core elements of a QoL assessment encompass physical, functional, psychological/emotional, and social/occupational attributes of a patient.<sup>[1]</sup> Changes on QoL scales are biologically unfamiliar to clinicians. Hence, it is crucial that researchers make the results on any QoL scale interpretable to clinicians by relating them to objective measures that are clearly described.<sup>[3,4]</sup> I will come back to this point later on.

The prevalence of strabismus in the general population is between 2% and 4%. Amblyopia resulting from strabismus often remains undiscovered, and timely and effective treatment is missed.<sup>[5]</sup> Despite such a high prevalence, patient-reported gains following corrective surgery in children with strabismus have not been sufficiently investigated. Corrective surgery reportedly improves overall QoL, as well as particular domains of QoL such as depression and self-esteem.<sup>[6-9]</sup> However, previous studies suffer from a variety of methodological limitations such as small sample size, lack of a control group, and use of different instruments with varied reliability and validity. These restrictions perhaps explain why a relatively large cohort study reported no improvement in QoL measures after corrective surgery for children with strabismus.<sup>[10]</sup>

In this issue of JOVR, Ziaei et al<sup>[11]</sup> report the results of their study that measures QoL after corrective surgery in children with strabismus. This study significantly contributes to our understanding of how surgical correction of strabismus positively impacts the affected children's lives. The study pools 90 patients from three referral eye centers in Tehran to increase the sample size and representativeness. The authors selected a QoL questionnaire used by the RAND Health Insurance Study<sup>[6]</sup> and modified it to meet the needs of their research. Ziaei et al<sup>[11]</sup> showed that most QoL domains improved following surgical intervention. Examples of patient outcomes positively influenced by surgery were functional limitation, anxiety, depression, positive well-being, as well as eye alignment concerns. Interestingly, the authors confirmed a positive correlation between the extent of ocular alignment correction with certain subdomains of QoL. The authors suggest a positive impact of corrective surgery on psychosocial functioning and well-being of children with strabismus.

As previously mentioned, the results of any QoL study are not easy to interpret. First off, the effect sizes are not objectively understandable, regardless of whether or not they reach statistical significance. For example, Ziaei et al<sup>[11]</sup> reported a difference of 22.3 scores (the largest effect size achieved in their paper) for eye alignment concerns after surgical correction. They also showed a difference of 2.8 scores, the smallest effect size calculated, for positive well-being. Both results were statistically significant at  $P < 0.05$ . However, these scale scores would be more easily interpreted if the authors presented some standardized loss of QoL scores for at least one event in life in understandable terms. For example, a major personal illness brings down the QoL score by 53 units.<sup>[3,4]</sup> If we assume this benchmark is valid for both children and adults, the score change of 22.3 for eye alignment concerns marks significant improvement and can be seen as a great benefit. Unfortunately, such practice is rare when QoL issues are being reported.

Cost information leverages the interpretation of calculated gains in QoL studies. The authors did not mention the average cost of corrective surgery for

strabismus. Providing cost information, even data as simple as overall estimates of the direct cost of surgery, would help provide reasonable advice and guidance on educated policy. The current study also comes with a few technical limitations. The lack of a control group is the most obvious restriction. For a robust evaluation of the results of intervention in observational data, especially when sample size is limited, it is critical to control for the treatment effect to ensure unbiased estimates. Furthermore, small sample size precludes subgroup analysis. Analysis for differential effect by gender, for instance, can be quite useful and informative. It is also important to note that the results of QoL studies are somewhat dependent on the choice of instrument. A prudent decision is to use an instrument that has been previously validated to measure the particular problem under investigation. Bremond-Gignac et al for example, have introduced a questionnaire tailored for QoL evaluations in children with strabismus and amblyopia.<sup>[12]</sup> It is sensible to justify the selection of the instrument when alternatives exist and may better fit the needs of the study.

Use of patient-reported outcomes (PRO) such as QoL measures is in the forefront of modern clinical research.<sup>[13,14]</sup> Recent trends suggest that in future years, PROs will be even more important than clinical/physician-reported outcomes.<sup>[15]</sup> The current manuscript by Ziaei, et al<sup>[11]</sup> expanded our knowledge on how children with strabismus can benefit from surgical treatment. Some of their results are significant. For example, the change in the score achieved on eye alignment concern is a clinically-meaningful finding because children with strabismus will continue to suffer from eye misalignment for their entire life span without proper treatment. The impact of corrective surgery can, therefore, be benchmarked with the impact of treating a major illness.<sup>[3,4]</sup> Such dramatic effectiveness warrants screening programs for timely identification and treatment of children with strabismus.

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