Correlation between Child Opportunity Index (COI) and Outcomes After Pediatric Anterior Cruciate Ligament Reconstruction.

Objectives

Social determinants of health intimately influence recovery from surgery and can often be overlooked [1,2]. The pediatric population, with little control over their environment and resources, are a particularly vulnerable population in this light. The Childhood Opportunity Index (COI) is a validated social determinants of health stratification system that uses 29 variables across three domains: education, health and environment, and social and economic factors which is linked to the US Census and the geographic location that a child dwells[3]. COI score ranges from 0 to 100 and is also organized into five categorical scores (very low, low, moderate, high, and very high) based on quintile rankings(diversitydatakids.org). It has been demonstrated across specialties that lower COI has a negative impact on patient outcomes. In postoperative congenital heart disease pediatric patients the lowest COI quintile had increased in-hospital mortality (OR: 1.29; P = 0.004)[4]. Also, Children living in low opportunity areas had greater 30-day readmissions and ED revisits[5]. Rosenberg et al demonstrated that COI score is independently associated with delay between ACL injury and surgery in addition to the incidence of meniscus tears at the time of surgery[6]. The objective of this study is to determine if there is an association between a patient's Child Opportunity Index and their post-operative functional and patient reported outcomes after ACLR. Our hypothesis is that less advantageous COI would be correlated with poorer PROs and functional recovery after ACLR. This would be a useful tool to utilize in a pre-operative setting to identify at-risk youth in order to lend more comprehensive postoperative support.

Methods

This is a retrospective review of prospectively collected data for patients under the age of 18 years old who underwent primary ACLR a single tertiary care hospital. Patient demographics (including COI score and quintile), patient reported outcomes (PROs), and postoperative functional outcomes were collected. Patient's address at the time of surgery was used to determine COI. PROs included the Knee Injury and Osteoarthritis Outcome Score (KOOS), Pediatric Functional Activity Brief Scale (PEDI-FABS) , Anterior Cruciate Ligament Return to Sport after Injury (ACL-RSI). Functional outcome testing included isokinetic quadriceps and hamstring strength at 60 and 180 deg/sec, single leg hop for distance, and triple hop for distance. Univariate analyses will be conducted to determine the correlations between the COI and functional and patient reported outcomes outlined above. Multivariable regression analyses will be used to determine factors that may be independently associated with failure to progress postoperatively in relation to COI domains.

Results and Conclusions

There are currently 200 patients included in our analysis. Statistical analysis of our cohort is delayed by our data acquisition department. Based on our preliminary cohort analysis, we do expect limitations in our results based on the range of COI quintiles to address. Most of the patients collected thus far stratify to higher COI groups, which reflects the surrounding neighborhoods of our institution. While this may limit the significance of our results, it still brings

important questions to the surface to encourage repeating these studies in diverse populations and geographies. The COI can be integrated into the electronic medical record to identify at-risk patients. With this, we can dedicate resources and early postoperative interventions and targeted rehab to assist in their postoperative success. The pediatric patient is a particularly vulnerable population in which all efforts should be made to investigate postoperative barriers to recovery and facilitate comprehensive postoperative support to those at risk for complications or delayed recovery.

References

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