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TOWARDS A CERVICAL DEFORMITY OUTCOME INSTRUMENT: PRINCIPAL COMPONENT ANALYSIS OF 89 HRQL QUESTIONS IN 476 PATIENTS WITH CERVICAL DEFORMITY

Introduction

No cervical deformity (CD) specific outcome measure exists and current HRQL are not tailored to the problems of CD. We analyze cervical alignment measures and individual questions from 7 HRQL instruments to identify items most relevant to CD.

Methods

CD measures and HRQL were analyzed in 415 pts meeting CD criteria ($cSVA > 4\text{cm}$ or $TS-CL > 20$) from a TLD database and 61 pts from a prospective CD database. Total NDI, mJOA, EQ5D and SWALQOL scores and their individual questions were analyzed within the CD cohort and items from the ODI, SRS, and SF36 were analyzed in the TLD pts. With a principal component analysis (PCA) individual questions correlating the most with the principal components were retained and used as a new outcome instrument that was correlated to the alignment measures.

Results

CD cohort: No alignment measure correlated with any NDI/mJOA/EQ5D total score. SWALQOL domains correlated with some CD measures (best $r = 0.37$, $p < 0.01$). PCA identified 10 items from the NDI/mJOA/EQ5D/SWALQOL that account for 76% of the item variance. This new CDc score correlated with C0-C2Angle ($r = 0.40$, $p = 0.005$) C2Slope: $r = 0.37$, $p < 0.05$) and number of kyphotic discs (nK : $r = 0.31$, $p < 0.05$). TLD cohort: Total HRQL scores correlated nonspecifically with some CD measures in both CD and noCD patients (best $r = 0.22$, $p < 0.05$). PCA identified 10 items from the ODI/SRS/SF36 that account for 75% of the item variance. This new CDt score correlated with $cSVA$ ($r = 0.24$, $p < 0.001$) and nK ($r = 0.15$, $p < 0.05$) in TLD pts with CD. The CDc and CDt scores included 13 item categories: swallowing, motor scores, sensory scores, reading, activity level, mental health, appearance, sleeping, general health, work, personal care, social life, and walking.

Discussion

Current HRQL measures do not correlate CD measures. A principal component analysis of 89 questions from the NDI, mJOA, EQ5D, SWALQOL, ODI, SRS and SF36 yielded 13 item categories that correlated with cervical deformity measures among 61 patients from a prospective cervical deformity database and 415 patients with CD from a thoracolumbar deformity (TLD) database.

Conclusions

Based on an analysis of 89 questions from existing HRQL, 13 item categories should be considered in a new CD disability measure.