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Validation of EQ-5D in patients treated for extremity sarcoma

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Abstract

Introduction: Quality of life (QoL) is an important consideration in the management of patients with extremity sarcomas (ES). While local tumour control has improved significantly over the past few decades, limb amputation and preservation surgery may result in significant disability and reduced quality of life. The clinical assessment of ES patients after surgery can involve use of questionnaires, and commonly used assessment tools include Toronto Extremity Salvage Score (TESS) and Musculoskeletal Tumor Society Scale (MSTS). However, as TESS and MSTS are disease-specific instruments, it is not possible to compare the health status of ES patients with the general population or other patient groups using these questionnaires. General health comparisons are necessary to understand the overall burden of the disease for a specific group of patients. Set of relevant measures and ease of use are important criteria when selecting a QoL instrument for clinical use. The EQ-5D provides a concise, widely validated instrument that can be used to assess health utilities and health-economic impact, and it consists of five categorical questions and a visual analogue scale. The purpose of this study is to test the validity of EQ-5D questionnaire to assess generic QoL in patients treated for ES.

Methods: A prospective cross-sectional survey was carried out between November 2014 and March 2015 with patients treated for ES at the Royal Orthopaedic Hospital (ROH) in Birmingham, UK. QoL data were collected using EQ-5D, EQ-VAS, TESS and MSTS from 197 patients who had undergone limb preservation surgery or amputation. Construct validity was assessed by comparing the EQ-5D scores and sub-components with measures of functional status in TESS and MSTS. Further, QoL in our sample of ES patients was compared with the general population and cancer patients in other studies. Binary logistic and linear regression adjusted for age, gender and upper vs. lower limb ES were used to study associations between predictor variables and QoL outcome measures.

Results: Results from 190 patients included in the analysis found that mean score (SD) for EQ-5D=0.65(0.30), EQ-VAS=73(19), TESS=73(25), and MSTS=77%(21). EQ-5D sub-scale responses in lower and upper limb ES were different only for mobility (Fisher's exact test two-tailed $P<0.001$). Mean TESS and MSTS scores by the five EQ-5D sub-scales, and correlations between the total scores (Spearman's rho =0.6-0.8, $P<0.001$), suggested good construct validity. Lower TESS and MSTS scores were associated with problems concerning mobility, self-care, usual activities and pain/discomfort, and lower TESS but not MSTS was associated with anxiety/depression. Predictors of worse quality of life varied according to the outcome measure, and included lower limb ES (vs. upper limb ES), bone sarcoma (vs. soft tissue sarcoma), higher grade and larger tumours, amputation and endoprosthetic replacement (vs. tumour excision), time from diagnosis, older age, and education not continued after school leaving age. EQ-5D subscales were more sensitive to predictor variables than the EQ-5D total score, and TESS and MSTS were overall more sensitive than EQ-5D. The lower predictive ability

may be associated with EQ-5D's shorter length and three-level answer scale. EQ-5D was lower and EQ-VAS higher compared to all cancers [EQ-5D=0.72(0.22); VAS=(68(20))]. The functional scores were lower compared to soft tissue ES [MSTS=89%(16)] and lower limb ES [TESS 84(16)].

Conclusion: The results suggest good construct validity for EQ-5D in ES patients but lower sensitivity to predictors associated with patient and disease characteristics. Lower limb ES, bone sarcoma, higher grade and larger tumours, more extensive surgery, longer time from diagnosis, low educational attainment, and older age were associated with lower quality of life. Shorter length and easy self-administration make EQ-5D a powerful tool, and the predictive value may be improved by using the new version of EQ-5D with a five-level answer scale.