METHODS: We conducted a prospective cohort study and recruited patients who were referred to a tertiary care center for CTS evaluation. Adults with a likely diagnosis of CTS based on a score of “Classic” or “Probable” on Katz Hand Diagram were included. Patients were stratified into two groups using the Boston CTS Symptom Severity Scale/Functional Severity Scale (SSS/FSS), with severe defined as SSS>33 and/or FSS>24. Utilities were measured indirectly by Short Form Sixth Dimension (SF-6D) and EuroQol 5D Questionnaire (EQ-5D-5L), and directly by Chained Gamble (CG) and Visual Analogue Scale (VAS). The Wilcoxon sum rank test was used to compare severe versus non-severe groups, and Pearson correlation coefficient was used to determine inter-instrumental agreement.

RESULTS: Twenty-nine patients (53%) met inclusion/exclusion criteria. Mean age was 57.8 years (SD=13.1), with 22 (75.9%) female patients, and 11 patients (37.9%) with severe CTS. Utilities for the entire cohort was 0.73 (SD=0.09) for SF-6D, 0.75 (SD=0.15) for EQ-5D-5L, 0.94 (SD=0.16) for CG, and 0.74 (SD=0.17) for VAS. Significant difference was found between the severe and non-severe groups for EQ-5D-5L (p=0.01), with utility of 0.64 (S=0.18) for severe and 0.81 (SD=0.07) for non-severe patients. However, this difference was non-significant for SF-6D (p=0.23), CG (p=0.53), and VAS (p=0.67). There was significant inter-instrumental agreement between SF-3D and EQ-5D-5L (Pearson=0.60, p<0.0001), SF-3D and VAS (Pearson=0.67, p<0.0001), and EQ-5D-5L and VAS (Pearson=0.55, p<0.0001). Correlation of CG with the other methods, SF-3D (Pearson=0.18, p=0.34), EQ-5D-5L (Pearson=0.08, p=0.69), and VAS (Pearson=0.08, p=0.70), was not significant.

CONCLUSION: Utility in this CTS patient population varied from 0.73 to 0.94 depending on the instrument. Variation in utilities between severe versus non-severe patients was significant for EQ-5D-5L only, demonstrating potential limitations in using utility tools to stratify patients according to disease severity. Given that utilities are incorporated as key measures in decision analysis and economic evaluation, the inter-instrument inconsistency found in this study may lead to challenges in constructing valid and reliable models. Future research is needed to determine how to reconcile such inconsistency.

A Genetic Risk Score for Carpal Tunnel Syndrome

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INTRODUCTION: Advances in our understanding of the human genome coupled with the rapidly falling cost of genome sequencing is ushering in an era of personalised medicine. Population-wide whole genome sequencing is becoming cheaper and more accessible1, and this will profoundly affect the way in which diseases commonly encountered by plastic surgeons are diagnosed and treated. We recently performed the first ever genome-wide association study (GWAS) of Carpal Tunnel Syndrome (CTS), and identified 13 genome-wide susceptibility loci. The aim of this study was to demonstrate one potential application of our findings.

METHODS: We developed a weighted genetic risk score2 (wGRS) for CTS based on the genetic variants discovered in our GWAS. We obtained genotypic and diagnostic data from UK Biobank, a prospective cohort study of ~500,000 individuals from the UK who have had whole-genome genotyping undertaken, and have allowed linkage of these data with their medical records. We used ICD-10, OPCS and self-diagnosis codes to identify individuals with CTS and diseases known to be associated with CTS, and investigated whether individuals with certain phenotypes are genetically predisposed to CTS.

RESULTS: There was a significant difference in wGRS between 12,106 CTS cases (0.326) vs 387,347 non-CTS controls (0.280) (p<0.0001), and also between 11,438 CTS patients who have undergone carpal tunnel surgery (0.328) and 668 CTS patients who have not (0.295) (p=0.00012). We did not observe an increased wGRS in patients with diabetes, rheumatoid arthritis, hypothyroidism and ulnar nerve entrapment. We found a highly statistically significant negative correlation between height and wGRS in both males (r=-0.044, p<0.0001) and females (r=-0.046, p<0.0001), and a weak positive correlation for BMI in males (r=0.0084, p=0.00032) but not in females (r=0.0038, p=0.075).

CONCLUSION: The significantly higher wGRS in operated CTS patients vs unoperated CTS patients suggests that our wGRS correlates with disease severity. The finding that
wGRS is not higher in individuals with diseases known to be associated with CTS suggests that extraneous factors (such as oedema in hypothyroidism and synovitis in rheumatoid arthritis), rather than shared genetic factors, are likely to predispose to CTS in these groups. The negative correlation between wGRS and height explains the observation that CTS patients are on average >2cm shorter than non-CTS controls in the UK Biobank cohort. We are currently extending the wGRS to our own cohort of deeply phenotyped CTS patients, to correlate wGRS with symptoms and electrophysiological test severity, as well as surgical outcomes. We believe it is important for plastic surgeons to be mindful of the increasing role that genetics will play in our practice, and this study illustrates the proof of principle that a wGRS can potentially serve as useful tool in the future for the prognostication of CTS.

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A Comparative Health Literacy Analysis of Online Carpal Tunnel Syndrome Resources Available in English and Spanish

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BACKGROUND: The internet has become an increasingly popular medium for consumers to obtain health information. Hispanics comprise the fastest growing minority group in the United States. Studies show that this demographic is increasingly utilizing the internet to obtain health information. However, it is unknown whether appropriate patient health materials for this patient population are keeping pace. Spanish-speaking Hispanics have lower health literacy levels which may preclude them from actively engaging in the decision-making process for their condition. There remains a paucity of materials evaluating existing online resources and their adequacy for patients with a lower health literacy levels. The aim of this study was to evaluate and compare online materials provided in both English and Spanish for carpal tunnel surgery, the most commonly performed hand surgery procedure using a multi-metric approach to assess readability, understandability, actionability, and cultural sensitivity.

METHODS: A web search using the English term “carpal tunnel surgery” was performed. The first 10 highest ranked institutional/organizational websites that provided carpal tunnel surgery information in English and Spanish were identified. All relevant online materials were evaluated using the SOL (Simplified Measure of Gobbledygook, Spanish), Patient Education and Materials Assessment for Understandability and Actionability (PEMAT), and Cultural Sensitivity Assessment Tool (CSAT) to assess readability, understandability, actionability, and cultural sensitivity, respectively. A Cohen’s kappa score was calculated to assess inter-rater reliability.

RESULTS: The average reading level of online English carpal tunnel surgery materials was greater than that for Spanish materials (p=0.011). However, Spanish materials included more complex words compared to English materials (p<0.001). No individual website was written at the recommended 6th reading grade level. There were no statistically significant differences in understandability or actionability. Average CSAT scores for Spanish materials were significantly lower than English materials, indicating poor cultural sensitivity (p=0.015). Cohen’s kappa was >0.81, indicating substantial agreement between raters.

CONCLUSION: Online patient-directed information regarding carpal tunnel surgery exceeded the recommended reading grade level for both English and Spanish-speaking populations and were difficult to understand. Most Spanish materials were often direct translations and were not contoured to the literacy needs of this demographic. Institutions must caution their authors to tailor their web material in a way that is sensitive to their target population to optimize comprehension and engagement in the care process.