Preliminary evidence of relationship between genetic markers and oncology patient quality of life (QOL)


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Background: Is there a relationship between the state of cancer patients' genetic structure and their quality of life? Genetic variants have been associated with patient toxicity or clinical outcome. There has been little work done exploring the relationship between genetic variants and patient QOL. We pose the following research question: is there any association between genetic markers in folate genes with oncology quality of life outcomes? Methods: 494 patients on a GI Intergroup phase III trial of metastatic colorectal cancer to investigate the efficacy for combinations of 5-fluorouracil, irinotecan, and oxaliplatin provided their genomic DNA samples and completed QOL forms (Symptom Distress Scale (SDS) and visual analog scales). Three folate candidate genes were evaluated (DPYD, MTHFR, and TYMS). Two sample procedures examined differences in QOL between patients with genetic variants and wild-type patients. Differences of at least 10-points on a 0–100 point range were considered clinically significant and p-values < 0.05 were considered statistically significant. Results: Genetic variants in DPYD*5 and TYMS TSER produced patient groups with differences in QOL. Statistically and clinically significant differences (10.3 points; p-value 0.008) on fatigue scores were found for DPYD*5-genotype. The A/A allele of DPYD*5 had lower fatigue scores (p=0.008). The TYMS TSER marker differed on overall SDS, fatigue and on outlook score (p=0.007, 0.02, 0.007 respectively). No difference was found on MTHFR genes (p>0.05). Conclusions: Folate homeostasis is important for cellular functions. The associations between DPYD or TYMS and QOL are encouraging. There is sufficient evidence to suggest that there may indeed be a link between genetic structure and QOL. This hypothesis-generating study involved only patients with colorectal cancer, and looked at only a small number of genetic markers and specifically-targeted QOL endpoints, and yet uncovered evidence of potentially strong and specific relationships. In particular, the relationship between fatigue and genetic structure is worthy of further study.

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