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Preliminary evaluation of a predictive blood assay to identify patients at high risk of chemotherapy-induced nausea

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Statement of the Problem: Chemotherapy-Induced Nausea and Vomiting (CINV) is a highly feared side effect in patients. CINV can negatively affect nutritional habits, ability to work and motivation to follow recommended treatment regimens. Even with modern interventions to prevent, manage and treat CINV, some patients will still experience moderate to severe nausea. Thus, there remains a need for risk assessment tools to avert the distress associated with symptoms in an effort to improve the well-being and quality of life of patients and their families.

Methodology & Theoretical Orientation: Chemotherapy-induced free radicals can trigger the on-set of CINV. Therefore, we hypothesized that individual ability to scavenge free radicals could be used as indicator for nausea. Our focus was on glutathione, a critical component in the defense against free radicals. Blood, drawn prior to treatment with platinum-based chemotherapy was mixed with the assay reagent Hydroxy Ethyl Disulfide (HEDS) and allowed to react with the glutathione recycling pathways. HEDS is converted into mercaptoethanol secreted by the cells. Produced mercaptoethanol is assayed by spectrophotometry. Obtained concentrations of mercaptoethanol were normalized to total red cell counts. The test result was used to predict risk of moderate-to-severe nausea. Predictions were then compared to self-reported outcomes using a questionnaire and noted in medical records to ascertain level of delayed nausea.

Findings: Using the described approach to predict nausea, we were able to correctly classify 89.1% of the patients as either experiencing moderate/severe nausea or no/mild nausea.

Conclusion & Significance: Early results from our prospective study suggest that a reduced ability to recycle glutathione (GSH) in the blood may offer an objective indicator of the development of delayed nausea that might better guide clinicians in their efforts to provide optimal patient-oriented care. The test had even higher accuracy among the over 55 years of age group and women of any age.

Biography

Margaretha Wallon has her expertise in biomarker research. She is spearheading the development of prognostic and predictive biomarkers for triple negative breast cancers. She is also passionate about improving the quality of life for cancer patients as they are going through their life saving treatments. Her work has resulted in the first blood based assay to predict delayed nausea prior to initiating treatment.

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Notes:

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