Screening by Pulse CO-Oximetry for Environmental Tobacco Smoke Exposure in Preanesthetic Children.

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Objective

The purpose of this study was to evaluate the ability of multiple wavelength pulse CO-oximetry (SpCO) to screen for environmental tobacco smoke (ETS) exposure in children. Background: Exposure to ETS is associated with an increased risk of perioperative respiratory complications in children. It is often difficult to obtain an accurate history for ETS exposure, so a preoperative screening tool is desirable. Carbon monoxide is a measurable product of tobacco combustion. Multiple wavelength pulse CO-oximetry is a recently developed point-of-care monitor.

Methods

Following IRB approval and parental consent, 220 children aged 1-16 years having outpatient surgical procedures were enrolled. SpCO was measured preoperatively three times with the Radical-7 Rainbow SET CO-oximeter (Masimo, Irvine, CA, USA). Immediately following induction of anesthesia, a blood sample for laboratory measurement of carboxyhemoglobin (COHb) and serum cotinine was obtained. Regression analysis determined the correlation of SpCO with serum cotinine values. Receiver operator characteristic (ROC) curves analyzed the discriminating ability of SpCO or COHb to predict ETS exposure based on cotinine cutoff values known to be present in children exposed to ETS. Agreement of SpCO and COHb values was assessed using Bland-Altman plots.

Results

SpCO did not correlate with cotinine (R(2) =0.005). Both SpCO and COHb had poor discriminating ability for ETS exposure (area under the ROC curve=0.606 and 0.562, respectively). SpCO values had poor agreement with COHb values. Conclusions: The point-of-care multiple wavelength pulse CO-oximeter does not appear to be a useful preoperative screening tool for ETS exposure in children.