

Correlation between Environmental Factors and Carboxyhemoglobin Levels in Pediatric Patients
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Background and Goal of Study

COHb (carboxyhemoglobin) is formed from the displacement of oxygen by CO (carbonmonoxide) in hemoglobin. Potential sources of CO are tobacco smoke, heaters, cooking stoves, fireplaces, automobiles. 39-71% of the children in the world is regularly exposed to SHS (secondhand smoking) in their houses. The contribution of smoking and the other environmental factors to postoperative adverse outcomes is well documented in adults but it is not clear for secondhand smoking children. We performed this observational study to measure COHb levels and environmental factors in children undergoing elective tonsillectomy operations.

Materials and Methods

We enrolled 100 ASA I-II pediatric patients scheduled for tonsillectomy under general anesthesia. The parents were asked to complete a 7-item questionnaire about the child's environmental air quality including major sources of CO, highlighting secondhand smoke and also coal using at home. The preoperative COHb levels of the children were assessed noninvasively using a CO-Oximeter (Radical Rainbow SET Pulse CO-Oximeter; Masimo, Irvine, CA, USA).

Results and Discussion

The mean COHb of all 100 patients was 4.98 ± 2.8 . When the all environmental factors were evaluated, the significant correlation was between coal use at home and high COHb levels ($p < 0.001$). CO exposure of the children was high in our study because of intense coal use at home with the ratio of 83% and mother smoking 15%, father smoking 39%, caregiver smoking 5%, guest smoking was 30%, windows of the house do not open every day 13% and no statistical difference between all other environmental factors.

Conclusion

This study provides limited insight into the COHb levels of children exposed to environmental sources and especially there was a correlation between coal use at home and high preoperative COHb levels. Preoperative high COHb levels may be alerts about intraoperative and postoperative anesthesia and surgery complications.

Reference(S): Yee B, Ahmed I.M, Brugge D et al. Second-hand smoking and carboxyhemoglobin levels in children: a prospective observational study. *Ped Anesth* 2010; 20:82-89