

The Usefulness of Noninvasive MetHb Monitoring at HBOT Department (Pulse CO-Oximetry Masimo Rainbow SET RAD-57).

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Introduction

To diagnose carbon monoxide poisoning (CMP), carboxyhemoglobin (COHb) is routinely measured by blood analysis. MetHb value was high even though COHb value was getting low in several cases. However, taking a blood sample may be harmful for the patients. Rad-57 measures COHb (SpCO) and MetHb (SpMet) noninvasively and continuously. We compared SpMet and MetHb values in CMP patients before and after Hyperbaric Oxygen Therapy (HBOT).

Methods

Ten patients with CMP undergoing HBOT participated. MetHb levels before and after HBOT were analyzed by CO-Oximetry (Radiometer ABL735) and recorded; simultaneously Rad-57 continuously measured SpMet. A clip sensor was placed on middle or ring finger, and in 7 subjects the sensors were covered with black plastic bags to shield from ambient light. The values of SpMet were recorded simultaneously with blood samples. Data was analyzed using Pearson's correlation coefficient and bias, and precision were calculated.

Results

Eighty-four blood samples from ten subjects with informed consent were collected. The average age of the subjects (7 males; 3 females) was 32.4 +/-11.4. Causes of CMP included 4 cases of briquettes coal, 4 fires, and 2 auto exhausts. MetHb and SpMet ranged 0.4% - 1.4% and 0.2% - 1.5% respectively. Comparison the data between MetHb group and SpMet group in all subjects, $r=0.68$ (N=84).

Conclusions

There was correlation between SpMet and MetHb levels in venous blood. Especially between SpMet obtained with shield sensor showed higher accuracy. A conventional pulse oximeter measures with two wavelengths, whereas Rad-57 is able to measure dyshemoglobin such as COHb and MetHb when used concurrently Masimo Rainbow SET with more than seven wavelengths. Thus, ambient light may influence the accuracy of Rad-57. Our data suggests that shielding a sensor may improve the accuracy of SpMet values. In conclusion, this new monitor, Rad-57, may provide for rapid and easy diagnosis of CMP as well as a reliable monitor during treatment of CMP.