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Diagnostic room-air pulse oximetry: Effects of age, smoking, sex, respiratory rate, blood pressure and body mass index

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Rapid and accurate detection of hypoxemia is critical to prevent serious complications; morbidity and mortality in many hospital settings, including the intensive care unit (ICU), emergency department, procedure suite, and operating room. However, oxygenation is difficult to assess on the basis of physical examination alone. For determining oxygen requirements, pulse oximetry has virtually replaced arterial blood gas sampling.

Objective: Relative to vital signs, our knowledge of pulse oximetry reference values in awake adults is limited. We sought to determine the distribution of oximetry (SpO₂) values in awake, asymptomatic adults and the effect of personal characteristics like smoking, sex, respiratory rate, pulse rate blood pressure and body mass index on these values.

The primary goals of our analysis were:

- (1) To describe the distribution of SpO₂ values in asymptomatic awake adults
- (2) To determine whether personal characteristics were associated with lower SpO₂ values.

Prospective cross-sectional study Using a cross-sectional design, we sampled oximetry readings in awake, asymptomatic adults who had no symptoms of acute cardiac or pulmonary disease and no history of emphysema or chronic obstructive pulmonary disease. We approached participants by inviting them to participate only if they were feeling in normal health. We excluded any who indicated they had any pulmonary symptoms. We specifically asked whether they had experienced any cough, shortness of breath, or chest pain, and we excluded any with affirmative responses.

Results: We collected data from 338 people, from southern region; of them 75 (22.2%) were female and 263 (77.8%) were males. The mean age was 29.6 years. Smoking status was distributed as, never smoked, 277 (82 %); previous smoker, 7 (2 %); current smoker 54 (16 %). Room-air SpO₂ values less than 94% were only noted in less than 6 % of the asymptomatic volunteers.

The statistical analysis showed there were no effects of age, smoking history, pulse rate, blood pressure, respiratory rate and body mass index on SpO₂ levels by room air pulse oximetry. But there were slightly higher SpO₂ levels noted for females (P-value 0.063). There were no female smokers in the study group.

Conclusion: Room-air SpO₂ values less than 94% are rare in asymptomatic, awake adults. No effects of age, smoking history, pulse rate, blood pressure, respiratory rate and body mass index on SpO₂ levels by room air pulse oximetry

Biography

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