

Disparate Motion-Resistant Pulse Oximetry SpO₂ and Pulse Rate Parameters in Awake Un-Sedated Neonate.

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Introduction

A case of ECG and saturation monitor SpO₂-pulse rate disparity is presented. Intravenous atropine was administered, possibly unnecessarily, before ECG readings indicated a true heart rate at three times the displayed pulse rate. This artifact in measurement was a previously unrecognized failure of motion-resistant pulse oximetry.

Case Report

An 11-day-old female patient with a history of bilateral cleft lip/palate presented to the dental operating room for a cleft palate oral impression procedure. The patient was otherwise healthy. In the operating room, motion-resistant pulse oximetry (Masimo Radical-7 Pulse CO-Oximeter, Masimo Corporation, Irvine, CA) indicated a pulse rate in the 150 to 215 BPM range and SpO₂ in the mid-90% range. Correspondingly, the patient appeared pink and saturated. The first oral impression was taken with the patient awake and un-sedated. During this procedure, the agitated patient appeared bradycardic (pulse rate in the 40 to 90 BPM range, SpO₂ in the mid-80% range). A patient plethysmographic waveform with good shape was present. Because of the bradycardia, an IV was placed and atropine (0.1 mg) was administered to the patient for suspected vagal bradycardia. The pulse oximeter sensor was readjusted and a patient plethysmographic waveform with good shape was again found to be present. When the bradycardia did not improve, yet the patient remained pink and SpO₂ remained in the mid-90% range, ECG leads were placed. A disparity was found between the pulse oximeter pulse rate (40 to 100 BPM range) and the ECG heart rate (200 to 230 BPM range), with SpO₂ values in the 90-100% range (Figs. 1 and 2). A second oral impression procedure was commenced and completed successfully. The patient was closely followed and found to be pink and feeding well when examined one hour later.

Discussion

Masimo's Rainbow Signal Extraction Technology (SET) was developed to enable their pulse oximeters to be motion tolerant.¹ Although rare, instances of accurate SpO₂ and inaccurate pulse rate extraction do occur with Rainbow SET pulse oximeters when excessive patient motion is present. It may, therefore, be good clinical practice to supplement motion-resistant pulse oximetry measurements with ECG readings or frequent heart auscultations while monitoring patients during neonatal cleft palate oral impression procedures, when patients are awake and un-sedated. The additional source of heart rate information would help clinicians ascertain the accuracy of pulse oximetry measurements and may reduce the occurrence of unwarranted drug administration.

1. Radical-7 Signal Extraction Pulse CO-Oximeter with Rainbow Technology Operator's Manual. Irvine, CA: Masimo Corporation, 2008