

A 6-Month-Old Infant With Different Capnography Values in Polysomnography



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A 6-month-old infant with a past medical history of hypoxic ischemic encephalopathy was referred for evaluation of snoring. She was born at 41 weeks' gestational age to a 25-year-old gravida 1, para 1 mother via vacuum-assisted delivery due to cardiac decelerations. The infant's Apgar scores were 1, 4, and 6 with nuchal cord and meconium at delivery. She was started on positive-pressure ventilation but eventually required intubation at approximately 40 minutes of life. Brain MRI showed abnormal areas of restricted diffusion, involving the corpus callosum, bilateral posterior limb of the internal capsules, and possible scattered areas of frontal and occipital lobe cortices.

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Physical Examination Findings

At the time of presentation the infant was being fed thickened formula every 2 hours with minimal spitting up. During wakefulness she did not have any breathing problems, choking, or gagging, and no noisy breathing was reported. During sleep she snored every night. The family had not noticed any abnormal posturing, stiffening, spasms, or abnormal movement activity.

The infant lived with both parents and slept in a crib in her parents' room. There was no exposure to smoking.

A review of systems indicated hypotonia. Her physical examination showed vital signs within normal ranges. An airway examination showed tonsils 1+ in size, the cardiovascular examination yielded normal results, and the neurologic examination indicated hypotonia.

Diagnostic Studies

An overnight polysomnogram (PSG) showed an apnea-hypopnea index of 0.2 and saturation nadir of 94%. Both end-tidal P_{CO_2} and transcutaneous P_{CO_2} were determined during the PSG. A 30-second epoch is shown in [Figure 1](#).

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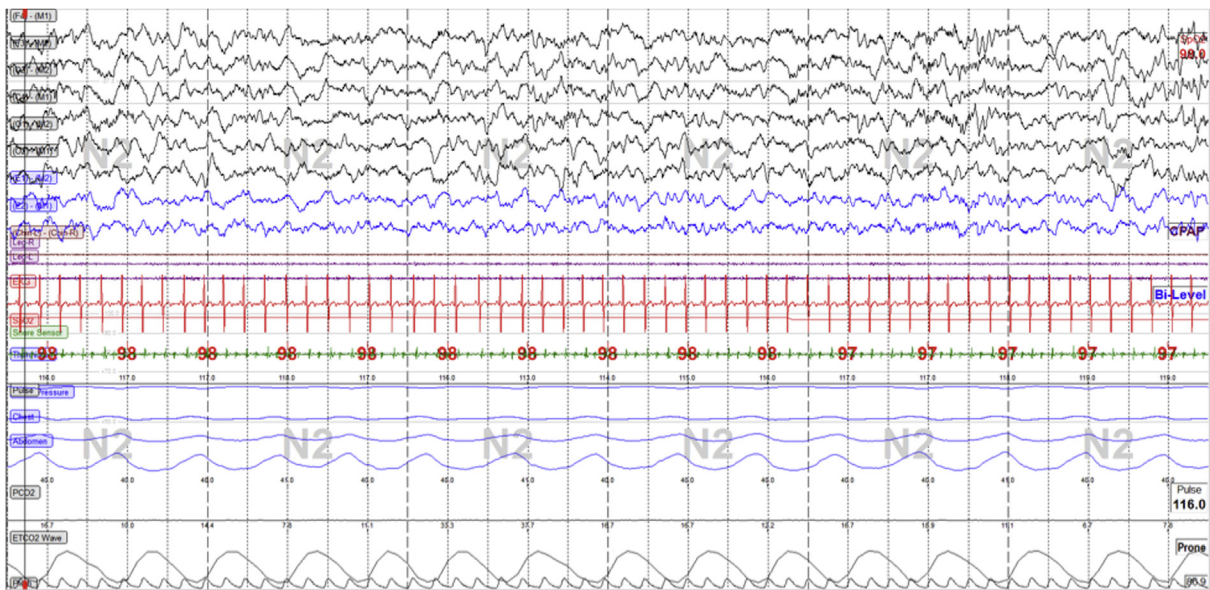


Figure 1 – Thirty-second epoch. Electroencephalogram leads (F4-M1, F3-M2, C3-M2, C4-M1, O1-M2, O2-M1), electromyogram leads (chin, Leg-L, Leg-R), ocular leads (E1-M2, E2-M1), respiratory sensors (thermistor, nasal pressure), transcutaneous PCO_2 (P_{CO_2}), end-tidal PCO_2 (ET_{CO_2} value), EKG leads, oxyhemoglobin saturation (SpO_2), pulse waveform (PWF).

What is the diagnosis?

Figure 1 shows transcutaneous PCO_2 signal and end-tidal PCO_2 signal; which one is accurate? And why do the end-tidal PCO_2 values change while the transcutaneous PCO_2 remains constant?

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