

This is the first report documenting that plastic blood gas syringes systematically over-estimate SvO2 levels when there is a delay in analysis or continuous mixing of the sample” Ghanpur et al (2016).

Abstract:

OBJECTIVES: Measurement of central venous oxygen (SvO2) levels remains an important method for the detection of circulatory shock. Plastic blood gas syringes have supplanted glass, these syringes are, however, permeable to atmospheric oxygen. Common sampling practices, including a delay between blood aspiration and analysis and continuous mixing of the sample may promote equilibration of the blood sample with atmospheric oxygen and could result in over estimation of SvO2 levels.

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METHODS: Pulmonary artery or central venous catheter blood samples were taken from 21 critically ill patients. Two venous blood gas samples were collected simultaneously in plastic syringes. One sample was continuously mixed, through a gentle rotation. The other sample was not mixed. Blood gas analyses were undertaken on both samples at baseline and at 5, 10, 15 and 20 minutes.

RESULTS: Compared with baseline levels, the SvO2 increased significantly over time for both continuously mixed and non-mixed samples ($P < 0.0001$). The rate of the increase was 2 fold greater for continuously mixed samples ($P < 0.0001$). For continuously mixed samples the SvO2 was 63% at baseline, 65% at 5 minutes, 70% at 10 minutes, 74% at 15 minutes and 78% at 20 minutes. For the non-mixed samples the levels were 63%, 64%, 66%, 68% and 70% respectively.

CONCLUSION: This is the first report documenting that plastic blood gas syringes systematically over-estimate SvO2 levels when there is a delay in analysis or continuous mixing of the sample. Over-estimation of SvO2 levels may harm patients as circulatory shock may not be recognized and treated.



Reference:

Ghanpur, R., Santamaria, J. and Dixon, B. (2016) Plastic Blood Gas Syringes and Measurement Error in Central Venous Oxygen Saturations. Shock. March 30th. .

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