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Detecting autologous blood transfusions: a comparison of three passport approaches and four blood markers.

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Blood passport has been suggested as an indirect tool to detect various kinds of blood manipulations. Autologous blood transfusions are currently undetectable, and the objective of this study was to examine the sensitivities of different blood markers and blood passport approaches in order to determine the best approach to detect autologous blood transfusions. Twenty-nine subjects were transfused with either one (n=8) or three (n=21) bags of autologous blood. Hemoglobin concentration ([Hb]), percentage of reticulocytes (%ret) and hemoglobin mass (Hbmass) were measured 1 day before reinfusion and six times after reinfusion. The sensitivity and specificity of a novel marker, Hbmr (based on Hbmass and %ret), was evaluated together with [Hb], Hbmass and OFF-hr by different passport methods. Our novel Hbmr marker showed superior sensitivity in detecting the highest dosage of transfused blood, with OFF-hr showing equal or superior sensitivities at lower dosages. Hbmr and OFF-hr showed superior but equal sensitivities from 1 to 4 weeks after transfusion compared with [Hb] and Hbmass, with Hbmass being the only tenable prospect to detect acute transfusions. Because autologous blood transfusions can be an acute practice with blood withdrawal and reinfusion within a few days, Hbmass seems to be the only option for revealing this practice.

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