



An experimental study was planned to assess the influence on routine clinical chemistry parameters of fist making prior to, and maintenance during, venipuncture” Lima-Oliveira et al (2016).

Abstract:

OBJECTIVES: An experimental study was planned to assess the influence on routine clinical chemistry parameters of fist making prior to, and maintenance during, venipuncture.

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DESIGN AND METHODS: Blood was collected from 16 healthy volunteers with two separate sequential procedures, entailing standard venipuncture with hand opened throughout blood collection, or clenching the fist 6 times before venipuncture and maintaining the fist until completion of blood collection. After separation of lithium-heparin plasma at vacuum tubes with gel separator, 28 routine clinical chemistry parameters and serum indices were measured on Roche Cobas 6000 [c501] module.

RESULTS: Fist clenching and maintaining were associated with significant variations of 8/26 (31%) analytes tested. Specifically, aspartate aminotransferase (+2.3%), calcium (+2.2%), chloride (+1.0%), creatine kinase (+2.0%), magnesium (+2.3%), potassium (+13.4%), and

sodium (+0.7%) increased, whereas phosphate (-5.0%) decreased. All variations except aspartate aminotransferase and creatine kinase exceeded the quality specifications for desirable imprecision. A remarkable increase of free hemoglobin in plasma (i.e., +28.2%) was also observed. The ratio of plasma potassium was significantly associated with that of plasma CK ( $r=0.55$ ;  $p=0.029$ ), but not with variations of other analytes. No significant correlation was observed between the ratio of free hemoglobin and those of other analytes.

**CONCLUSIONS:** The results of our investigation demonstrate that repeated clenching and maintenance of fist during venipuncture may trigger acute variations of several routine clinical chemistry parameters, which may be attributable to muscle contraction, hemolysis or both. Accordingly, venipuncture should be performed avoiding fist clenching and maintenance.

Reference:

Lima-Oliveira, G., Guidi, G.C., Salvagno, G.L., Brocco, G., Danese, E. and Lippi, G. (2016) Estimation of the imprecision on clinical chemistry testing due to fist clenching and maintenance during venipuncture. *Clinical Biochemistry*. July 19th. .

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