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Statistical validation of ^{1}H-NMR protocol *vs* standard biochemical assay in quality control of RBC packed units.

Short title: Statistical validation of NMR in RBC's unit quality control

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Highlights

- ^{1}H-NMR spectroscopy is an accurate and precise method for metabolite quantification.
- NMR is useful to quantify metabolites for which no commercial kits are available.
- ^{1}H-NMR has been validated as analytical method to assess RBC's unit quality.

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ABSTRACT

Background: Time dependent quantification of endogenous metabolites in biological samples (blood, urine, biological tissues extracts) in normal and pathological conditions as well as following therapeutic protocols is well established. In the clinical practice, such a dynamic flux of information allows the physician to identify and appreciate alterations associated to biochemical pathways of specific organs. In the years, many biochemical assays have been developed to detect, selectively, this vast array of molecules.

Methods: The Proton Nuclear Magnetic Resonance (^{1}H-NMR) spectrum allows the identification and quantification of more than 30 RBC-associated metabolites with minimum manipulation of the sample. To validate the use of ^{1}H-NMR spectroscopy for quality control purposes in