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Inter-individual Variation of Mitochondrial DNA Deletion Percentage in Platelets

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Aim of the study: ATP production and content have shown a possible correlation between an accumulation of the 'common' 4977 bp mtDNA (mtDNA4977) deletion.Functional mitochondria are present in platelets and mitochondrial dysfunction can alter bioenergetic function in platelets. Although many studies have shown very low amounts of 4977 bp deletion with inter-individual variation in fast replicating tissues including blood. As related to blood, these studies are on peripheral blood leucocytes and it is unclear whether this mutation occurs in platelet.

Material and Methods: To better understand this variability, we measured the mtDNA4977 deletion levels in platelets of 23 healthy individuals (aged: 27- 42) as related to ATP production. The deletion in platelet samples was detected in 12 (about 52 %) of the 23 cases with the different frequencies, using a quantitative real time PCR. The percentage of the coefficient of variation (CV) is also higher in samples (about 250%).

Results: No correlation was found between the deletion levels and intracellular ATP content of platelets. Our findings may suggest that inter-individual variation in the mtDNA4977 deletion level of platelets does not seem to have an important impact on mitochondrial dysfunction in relation to ATP production.

Keywords: Mitochondrial deletion, mtDNA4977, inter-individual variation, ATP, Platelet