MITOCHONDRIAL MUTATIONAL EVENT IN AN ADULT PATIENT WITH RENAL FAILURE AND CARDIOMYOPATHY

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Case presentation: We investigated a 62 years old male affected by hypertrophic cardiomyopathy (HCM) and renal failure that caused already a bilateral transplantation. Pathological anamnesis revealed also diabetes, deafness and Crohn disease. Family history of cardiomyopathy in the mother and three brothers, one of which died of renal failure at 26 years, was also reported. These clinical features suggested us a mitochondrial involvement.

Methods and Results: Genomic DNA from peripheral blood and buccal cells was extracted and the whole mitochondrial genome was amplified by two pair of primers. The PCR products were then sequenced and compared to mitochondrial reference sequence (rCRS NC_012920). In both biological samples the mtDNA analysis showed the heteroplasmic A3243G mutation in the $tRNA^{Leu\ (UUR)}$, frequently associated with MDs. The interesting finding presented here support the knowledge that mitochondrial gene altertation represents a possible etiology in cardiological patients with unexplained renal failure. This is particularly true, as in this case, when other associated symtoms linked with dysfunctional oxidative phosphorylation are present.

Discussion and Conclusion: Mitochondrial diseases (MDs) (10/100.000) represent a wide group of human disorders, extending from isolated organ involvement to complex syndromes. MDs are caused by defects in oxidative phosphorylation due mainly to mitochondrial DNA alterations (mtDNA), while nuclear genome mutations are somewhat rare. The heterogeneous clinical phenotype, including neurological and non-neurological manifestations, depends on the tissue involved, specific mtDNA mutations and their heteroplasmic level. Diabetes and deafness are the most common features while adult renal impairment is more rarely reported, probably because of lack of association to mitochondrial conventional phenotypes. Furthermore, cardiological involvement, leading to hypertrophic remodelling, occurs up to 40/50% of patients with MDs and the mtDNA A3243G $tRNA^{Leu\ (UUR)}$ mutation has been also associated with disease manifestation.

The case presented in this report further suggests that a differential diagnosis in presence of HCM should be solved by a multidisciplinary approach together with mutation analysis of mitochondrial DNA.