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Micro RNAs in tears as biomarkers for monitoring primary open-angle glaucoma

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Purpose: To utilize the tear film as biological source of micro RNAs (miRNAs) in order to analyze its profile in relation to primary open angle glaucoma (POAG).

Material & Methods: A total of 30 participants (POAG patients (GG; n=15) and matched healthy controls (CG; n=15)) were interviewed, ophthalmologically examined and extracted their reflex tears atraumatically from the inferior meniscus (20-30 microL) with a Pasteur micropipette that were stored at -80° until processing. The mercury TM RNA isolation kit (Exiqon, Denmark) was used for RNA extraction. The SPSS 15.0 program was used for statistical analysis by integrating all variables.

Results: Mean age of the participants was 70±2 years in the GG vs 68±2 years in the CG. We extracted RNA from the pooled tear film samples and its quality was evaluated using Agilent Bioanalyzer 2100. Then, pure RNA (<200 nucleotides) was utilized to generate a sequencing library for small RNAs. It was obtained significantly higher purified RNA in tears from the GG as compared to the CG [11±1 ng/mL vs. 8±2 ng/mL of pure RNA respectively (p<0.001)]. By next generation sequencing it has been detected a high variety of matured miRNAs with a differential expression profile in tears from both groups of participants.

Conclusions: Tear film sampling is a non-invasive, relatively simple and efficient process for glaucoma research. The miRNAs obtained from tears can be used for quantitative and qualitative assays to improve knowledge on the molecular basis of POAG. The possibility remain that specific miRNAs can be used as biomarkers for better monitoring the diagnosis and therapy of the glaucomatous patients.

Biography

Maria D Pinazo-Duran received her medical degree and gained PhD at the University of Valencia (Spain), this latter on the subject of developmental neurodevelopment and toxicology of the visual system, mainly the effects of drug and alcohol exposures. She is the foundational member of the Spanish Society of Developmental Biology and from the Spanish Glial Net. She is active member of various professional societies and reviewer of international journals. She is the Founder and Managing Director of the Ophthalmology Research Unit "Santiago Grisolia" in Valencia. Currently she is General Research Coordinator of the Health Department Valencia- University Hospital Dr. Peset (Valencia-Spain).

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