Oxidative Stress Markers in Adults from the Mexico City Metropolitan Area

Rubén Marroquín[1], Tovalin Horacio[2*], Hernández Martha[1], González Gonzalo[1], Rodríguez Tracy[1].
[1]Laboratorio de Microbiología e Inmunología, FES Zaragoza-UNAM, México [2]División de Estudios de Posgrado, FES Zaragoza-UNAM, México.
* E-mail: horaciotovalin@yahoo.es

Objective.
Our objective was to study some oxidative stress markers (C-Reactive Protein (CRP), ceruloplamin, nitrites (NO_2^-), and glutathione peroxidase (GPx)) in a group of adults living in different sites in Mexico City Metropolitan Area (MCMA), during the "MILAGRO-MCMA2006" campaign.

Methods.
Blood samples were collected form adults living into the MCMA at two urban sites: Iztapalapa, México City (T0), Tecamac, Mexico (T1) and one semi-rural site: San Pedro, Hidalgo (T2), and as a control group, people living in Santa Ana, Tlaxcala (TT). Informed consent was obtained for all participants.

CRP levels in plasma were measured using a latex particle-agglutination assay (Wiener Labs., Arg.). Nitrite levels were measured using the Griess¨ reaction. Plasma ceruloplasmin values were assessed with radial immunodiffusion (RID) plates, using rabbit serum anti human ceruloplasmin. GPx activity was measured following the method of Paglia and Valentine (Ransel kit, Randox, U.K.)

Results.
A group of 130 people was studied; 41 from T0, 54 from T1, 26 from T2, and 9 from TT.
CPR, ceuloplasmine and GPx mean levels showed significantly higher concentrations at T0 adults (2 U/mL, 90 mg/dL, 75 U/g. of hem, respectively) than in the other sites, while nitrites in plasma concentrations were significantly lower at T0 (57 umol/L) than in the other areas.

Conclusions.
The CRP is an inflammation marker and increase as response to acute injury; ceruloplasmin is one of the acute-phase proteins, released in response to infection and inflammation, as well as superoxide scavenger and GPx, an antioxidant enzyme, reacts against H2O2. These three oxidative stress markers levels in the adults at T0 probably expressed their chronic response to the oxidants air pollutants in the area. The nitrite levels, are associated with the release of nitric oxide (NO) by acute inflammation processes, for that reason probably these levels were lower at the urban site, as an adaptation process of this population.