

AIR POLLUTION IN URBAN AREA COULD HIGHLY ALTER THE BIOCHEMISTRY OF HUMAN TEARS!

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ABSTRACT

Human eyes are subjected to many man made and natural environmental pollutants. Emissions of motor vehicles, for example, are a very major source of heavy metals. On the other hand, many chemicals originated from industrial and agricultural activities as well as dust and various pH conditions are other causes of air pollution. Stability and functionality of tear film plays an important role in ocular surface diseases. Dry-eye patients typically suffer from discomfort, burning, irritation, photophobia and blurred vision. They are subjected to increased risk of corneal infection and resulting irreversible tissue damage. Analysis of tear film components, especially tear protein profiles has played a significant role in diagnostic of ocular surface diseases and in development of new therapies. The aim of this piece of research was to study the effect of environmental pollutants to the stability of tear proteins. 100 healthy volunteers, 50 lived in Rasht, a city in North of Iran near Caspian Sea (group I), and 50 (group II) lived in south of Tehran, the Capital of Iran with highly polluted air due to industrial activities and congested traffic. The subjects, all male and aged 20-30 years old, filled a questioner in order to get some information about their health and eye disorders history. Total tear proteins and lysozyme concentration were measured and the proteins separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). The results showed some alternations in tear protein pattern of group II compared to group I. The number of electrophoretic bands in tears of group II, i.e. people living in highly polluted air conditions was about 25% more than non-smokers. The activity of lysozyme and total tear proteins were also higher in this group. The results indicate that the environmental conditions and presence of some toxic metals in the air increase the production of tear immunoglobulin and activity of lysozyme. It is not surprising that the incidence of dry eye syndrome be higher in this second group.

Key words: Human tears, air pollution, dry eye, lysozyme activity.