

POSTER PRESENTATION

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# In Vitro Fluoride Induced Genotoxic Effect on Human Blood Lymphocyte Cells and its Amelioration by *Emblica Officinalis* Extract

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## Background

Fluoride is a widespread industrial pollutant. Although, acute and chronic exposure of fluoride results in adverse health effects, in vitro studies demands for further evidences to conclude on the role of F as genotoxic agent. We have investigated the genotoxic properties of fluoride on peripheral blood lymphocyte cells and evaluated the protective effect of *Emblica officinalis* (Amla) against fluoride toxicity.

## Materials and Methods

Peripheral blood lymphocytes were cultured and treated with different concentrations of fluoride (17  $\mu$ M, 34  $\mu$ M, and 51 $\mu$ M) and supplement with amla extract(20  $\mu$ g) for the study of various genotoxic parameters such as sister chromatid exchanges (SCEs) and cytokinesis block micronucleus (CBMN) assay. To rule out the antioxidant properties of amla, indices like 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay and High performance thin layer chromatography (HPTLC) were done.

## Results

Fluoride exhibited a significant increase in SCEs per metaphase plate ( $p < 0.001$ ) and SCEs per chromosome ( $p < 0.05$ ). Similarly, cell cycle proliferative index significantly decrease ( $p < 0.001$ ) in a dose-dependent manner in the three fluoride dose groups. Genotoxic indices such as nuclear deformities and frequency of micronucleus significantly ( $p < 0.001$ ) elevated with increased fluoride concentration. Furthermore, nuclear division index (NDI) and cell viability also noticed to be declined

in fluoride treated cultures. Cultures with high dose of fluoride co-supplement with amla extract indicated a remarkable recovery in these genotoxic indices as comparable to control cultures. Antioxidant analysis of amla extract showed high free radical scavenging activity with  $EC_{50}$  value of  $55.44 \pm 0.12 \mu\text{g/ml}$ .

## Conclusion

Amla has a strong antioxidant system to scavenge the free radicals generated through toxic effect. Amla showed an antigenotoxic effect against fluoride and thus has a great potential for the application in medicinal products.

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