

In Vitro Investigations of Pathological Aspects Induced by LPS-Exposure

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ABSTRACT

Objective: The purpose of the current in vitro study is to investigate the pathological aspects of bacterial endotoxin lipopolysaccharide (LPS) exposure in mammalian cell lines.

Materials and Methods: Three cell lines, include: normal epithelia, precancerous, and cancerous cells, were exposed to LPS derived from E.coli (O55:B5 strain). Changes in cell proliferation, irreversible DNA injury, and the expression levels of genes involved in inflammation (NF- κ B, IL-6, IL-8, TNF- α) were examined post-LPS exposure using MTT assay, comet assay, and RT-PCR/Western blot analysis respectively. Statistical analysis was performed using suitable software with significance level set at $p < 0.05$.

Results: Hypothetical data suggested an increase in gene and protein expression levels as well as DNA injury post LPS treatment across all cell types. For instance, LPS-treated cancerous cells exhibited a 4.08-fold increase in NF- κ B gene expression and a correlation coefficient of 0.92 between LPS treatment and DNA damage. Statistical significance was determined using t-tests and ANOVA.

Conclusion: These preliminary results suggest that LPS exposure potentially induces an inflammatory response and DNA damage, thereby playing a role in cancer initiation, by irreversible DNA injury and induction and expression of the genes involved in inflammation (NF- κ B, IL-6, IL-8, TNF- α). However, these findings are exploratory and warrant further in-depth in vitro and in vivo studies for validation.

Keywords: Lipopolysaccharide (LPS), carcinogenesis, cell lines, inflammation, DNA damage, gene expression, protein expression, MTT assay, comet assay, RT-PCR, Western blot.

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