

Evaluating the levels of Endotoxins in health care facilities

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Endotoxins are biologically active lipopolysaccharides (LPSs) produced by the most external layer of cellular walls of Gram-negative bacteria, and are present ubiquitously in the environment. Endotoxin levels are related to the occurrence of Gram-negative bacteria and acute health effects like dry cough and shortness of breath, decrease in lung function, fever reaction and malaise, dyspnea and headaches have been described as occurring upon endotoxin exposure as well as chronic health effects caused by the inflammatory response within the airways. Although many studies have already associated endotoxin exposure, especially in workplaces, to airways disease, a threshold limit value for occupational exposure has not been set yet, and the only available reference is from the Dutch Expert Committee on Occupational Safety (DECOS) that recommends a health-based occupational exposure limit (HBROEL) for endotoxin of 90 EU /m³ over an 8-hour period. Nevertheless, this limit has been subject of some criticism as it was established based on human volunteer exposure challenge studies and not workplace studies, and therefore, may understate the adverse effect of lowest concentrations of endotoxin. Environmental monitoring is usually performed by sampling airborne dust and subsequent analysis by the *Limulus* Amebocyte Lysate (LAL) assay. This study aims to assess the levels of endotoxins present in different areas of a Central Hospital in Porto, Portugal, to determine the occupational exposure risk, as well as to compare two sampling methods: sampling on glass fiber filters with air pump following the European Standard (2003) EN 14031 and sampling by vacuumed dust. Fifteen air samples and 5 dust samples were obtained. Endotoxin levels varied between 0,07 and 6,46 EU/m³ (air samples), and between 5,72 and 23,0 EU/mg of dust, and the Nursing Room and the Operating Room presented the highest levels, respectively.

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