

INDOOR MICROBIAL AIR CONTAMINATION IN SOME COLLEGE ROOMS AND HOSPITALS IN BASRA CITY

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ABSTRACT : Total of 120 samples have been collected from indoor air of hospitals and the College of Science, University of Basra, during the period from Dec. 2018 to Jan. 2019, in Basra governorate, Republic of Iraq. The study included samples from indoor air of Basra Teaching Hospital and Ibn Ghazwan Hospital for women and children. 96 bacterial isolated, 46 of which were in the College of Science, 25 in Ibn Ghazwan hospital, and 21 in Basra Teaching hospital. The results of the current study showed the differentiation of the presence of bacterial isolates that are Gm+ bacteria outperformed the number of isolates on Gm- bacteria, as the number of Gm+ bacteria reached 69, while the number of Gm- bacteria reached 21 bacterial isolates. The results showed the presence of *Staphylococcus* in all study sites, rare bacterial species have also been isolated for the first time in the indoor air of hospitals in Iraq (*Staph. hominis*, *Staph. haemolyticus*, *Granulicatella elegans* and *Pantoea* sp.) in Ibn Ghazwan hospital and (*Staph. warneri*, *Staph. vitulinus*, *Kocuria kristinae*, *Kocuria rhizophila* and *Pseudomonas fluorescens*) in Basra Teaching hospital, many of them cause hospital acquired infections. The sensitivity of bacterial isolates to some common antibiotics has been tested as streptomycin, vancomycin, Gentamycin, tetracycline and erythromycin. *Staph. vitulinus* has been shown to be resistant to all antibiotic used, while other bacterial isolates showed a different variation in their sensitivity to antibiotic.

Key words : Indoor air, microbial contamination, hospitals, college of science.

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INTRODUCTION

Most people spend 90% of their lives inside buildings in homes, offices, schools, universities and hospitals etc. (Abd EL-Hameed and Farag, 1999). So, the Environmental protection Agency (EPA) considered that indoor air quality is one of the most important environmental health problems, these problems are generally caused by two types of conditions, the first being the lack or inadequate ventilation inside the building, and the second is the exposure to one or more sources of pollution in the buildings (MS Hospital Consulting, 2001; Halli *et al*, 2015).

Air inside buildings can be polluted by a number of pollutants such as bacteria and other microorganisms (Amarasekera *et al*, 2010). Human activities inside indoor areas are the main factors that increase air pollution by microbes. Other sources are the presence of animals, plants in cooling system, dust and other factors that come from outside air (Jones, 1999). Microorganisms

that pollute the air inside buildings can cause allergies, respiratory and immune diseases (Douwes *et al*, 2003).

The complex environment of hospitals requires special attention to ensure air quality within hospitals, the protection of patients, as well as health care personnel from hospital infections (Verde *et al*, 2015). The presence of high levels of microorganisms in the air of the internal environment of hospitals is a worrying factor with regard of infection caused by these microorganisms (Lugauska and Krikstaponis, 2004), it also gives an indication of the degree of cleanliness of the internal environment of the hospitals that contains different types of microorganisms (Saad, 2003).

Hospitals may be the source of infection for many diseases such as tuberculosis, diarrhea and other serious diseases, as well as problems of increasing disease resistance of common antibiotics (Emuren and Ordinioho, 2015), in the United States, for example, there are about 2 million patients infected with hospitals due to air pollution,