The Effects of Methyl Methacrylate Exposure on Dental Technicians’ Lung Function


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Introduction:
Dental technicians are an essential member of the dental team who are highly skilled in design and have a daily laboratory work to create dental prosthesis including: crowns, bridges and implants based upon the measurements of the dentist to replace missing teeth. (Abakay et al., 2013). Dental technicians have multiple occupational exposure to various materials such as silica, plaster and methacrylate (Scherperel et al., 2004). All dental materials contain several amount of allergens and irritants that have adverse effects and give rise to health issues in the occupational exposure (Lyapina et al., 2013).

Health concern in this occupation includes potential adverse respiratory effects caused by inhalation of dusts from grinding and polishing of the metal alloys (Hu et al., 2006). Short term exposure to high levels of materials could induce significant health effects, i.e., eye, nose and throat irritation, headaches, nausea, or dizziness. Long-term exposure to these pollutants causes respiratory, dermatological diseases, and/or allergies (Hong et al., 2015).

Based on several reviewed literatures, a list of respiratory diseases associated with dental technicians include: pneumoconiosis, asthma, hypersensitivity, fibrosis, pulmonary granulomatosis, and lung cancer (Alavi et al., 2011).

Aim
The aim of this study is to examine the effects of MMA exposure on pulmonary function tests (PFT) variables in healthy dental technicians in Saudi Arabia.

Materials and Methods:
A total of 52 healthy participants were randomly recruited for the study. The group was divided into an experimental (n=26) and a control group (n=26). The experimental group included dental technicians with known exposure to MMA. Inclusion criteria for both groups included healthy subjects with average age, height, and weight for both study groups. Ethical approval was obtained from the IRB of the Scientific Research Unit (SRU) at Riyadh Medical College, Riyadh, Saudi Arabia. All study participants signed a consent form.

Data Collection:
Baseline PFT and demographic data were collected for all study participants, experimental and control. Those in the experimental group were asked to provide information on the years of experience and work hours/day. PFT values were collected using a hand-held spirometer device (Breeze, MedGraphics, USA) calibrated as per manufacturer’s recommendation prior to use. Test criteria were all in accordance with American Thoracic Society (ATS) standardization 2005.

Statistical Analysis:
Data were entered into the computer and analyzed using Excel software (Microsoft, USA). Unpaired student’s t-test was used to test difference in means between variables. Level of significance set at p<0.05. Data are presented as Means±SEM.

Results:
This study was carried out in 6 dental laboratories at Riyadh city. A total of 52 healthy participants were randomly recruited for the study. The group was divided into an experimental (n=26) and a control group (n=26). The experimental group included dental technicians with known exposure to MMA. Inclusion criteria for both groups included healthy subjects with average age, height, and weight for both study groups. Ethical approval was obtained from the IRB of the Scientific Research Unit (SRU) at Riyadh Medical College, Riyadh, Saudi Arabia. All study participants signed a consent form.

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Conclusions:
It is concluded that our results support the hypothesis can be responsible for pulmonary functions disorders in the dental technicians. However, MMA is not thought to be carcinogenic to humans. According to the obtained data, several techniques should be used to minimize the adverse effects and give rise to health issues in the occupational exposure (Lyapina et al., 2013).

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References


