The Use of an Air Filtration System in Podiatry Clinics

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Introduction

A small-scale study was conducted to ascertain the efficiency and effectiveness of an air filtration system for use in podiatry/chiropody clinics (Electromedia Model 35F (A), Clean Air Ltd, Scotland, U.K.). Three clinics were identified enabling comparison of data between podiatry clinics in the West of Scotland.

Methodology

Electromedia Model 35F (A) Figure 1

Room air passes through the filter system, removing particulate and gaseous matter, before returned to the room via the air outlet at the selected air flow rate. Allergens e.g. dust mites, cigarette smoke, micro-organisms and gases and vapours are removed during a three-stage sequence. This includes both a high voltage cassette and proprietary chemisorption medium.

The system under test is primarily designed to eliminate the primary inhalable allergens from the home and small respiratory ward, concurrent with Sick Building Syndrome (SBS).

Surface Air Sampler

The sampling was conducted using a portable Surface Air Sampler (Surface Air Sampler, Cherwell Laboratories, Bicester, UK) through which air is drawn at a quoted flow rate of 180l/minute. Nutrient agar (Oxoid) was used in conjunction with the sampler.

Sampling was conducted on two days at three sites before and after installation of the filtration units. The three sites were single occupancy chiropody rooms in modern (1960's-70's) Health Centres, specifically used for podiatry treatments on a daily basis. Sampling was performed at the start of the day before any patient treatments, at lunchtime, at the end of the morning session and at the end of the afternoon session. Samples were collected in duplicate, one of the general circulating air, away from the work-station/podiatrist and one in the breathing zone of the podiatrist.

The plates were then incubated at 37^{0}C for 48hours, followed by 25^{0}C for 7 days. Colonies were then counted and expressed as Colony Forming Units (CFU's). Microbial density was then calculated as:

number of colony forming units on plate x 1000/60 x digital setting

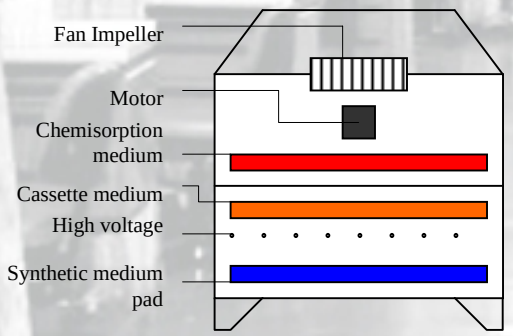

Figure 1 Electromedia Model 35F (A)

Results

The data collected from the aerobiology stage of the study was entered into Genstat 5 for statistical analysis. An analysis of variance was conducted.

A clear, demonstrable, global reduction in microbial organisms following the installation of the filtration systems is evident (Figure 1). The global results of the study indicate the filter has a statistically significant effect on microbial counts, with an average percentage decrease of 65%.

With regard to the qualitative data collected within this study, all of the practitioners, with the exception of one, experienced symptoms concurrent with the patterns of SBS. However, the filtration units in most cases did not appear togreatly influence the number or severity of the symptoms suffered. A few practitioners did, however, comment that they considered the time frame of the study to be too short to fully appreciate any benefits.

Conclusion

The results of this small-scale study demonstrate that the installation of the Electromedia Model 35F (A) statistically reduces the number of CFU/m^3 in the podiatry settings tested. In addition to quantifiable measures, subjective data collected by the questionnaire suggests that the filtration units do improve the quality of the indoor air, with many of the respondents and some of the patients commenting that the room environment was much 'fresher' and 'cooler'.

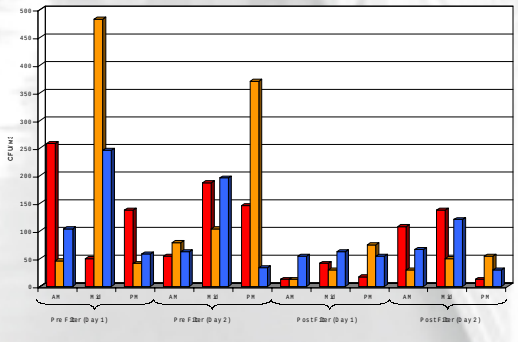

Figure 2 CFU/m^3 in Relation to Filter Placement, Clinic and Time of Testing

Reference

Environmental Protection Agency (1991) Indoor Air Quality Complaint Form. *In: Building Air Quality - A Guide for Building Owners and Facility Managers*.
Availablefrom: http://www.epa.gov/iaq/base/graphics/iaq.pdf