

The Improvement of Air Bacteria Counts among Out-Patient Department Areas at a Regional Hospital

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The air quality within a hospital is particularly concerned by the nosocomial infection control personnel. In order to decrease the bacteria counts in air, we detected the number of bacteria counts by a wind tunnel instrument among Out Patient Department areas for ten times. The colony counts of the plate behind the filter with Bio-Kil (3 CFU/hr/plate) were significantly less than those without Bio-Kil (14 CFU/hr/plate) (paired *t* test, $p < 0.001$, $n = 10$). The average removal rate of bacteria counts was 79% by the wind tunnel test. Addition of Bio-Kil to the filters of air conditioners in the hospital was effective to decrease colony counts by 57.5%. To further evaluate the actual bacteria counts in the air, we compared the air quality after the introduction of Bio-Kil among the OPD areas. Air specimens were collected from A, B, L (rooms 35 to 40), D (rooms 1 to 20), F (the aisle between Chest Medicine room and Orthopedics room), K (lobby), and M (Outpatient Service Counter). Air specimens were collected twice a day (morning and afternoon) during weekdays for six weeks. The filters on hospital air conditioners without Bio-Kil were not exchanged until after six weeks. Within the next nine weeks, a new filter with Bio-Kil was installed and kept unchanged. No matter whether the Bio-Kil was introduced, the bacteria counts collected from A, B, L were always lower than those from another four collection sites. One possible explanation may be that the latter four sites are closer to the outdoor area, and many OPD patients may bring in bacteria when they visit the hospital. Generally speaking, the average bacteria count in the air was 108.8 CFU/hr/plate ($n = 420$) without Bio-Kil and 68.6 CFU/hr/plate ($n = 630$) with Bio-Kil (Student's *t* Test, $p < 0.001$). Addition of Bio-Kil apparently reduced the bacteria counts by 30-47% among the seven collecting sites. Furthermore, the use of Bio-Kil could reduce the filter-exchange frequency, not only saving the maintenance cost but also protecting the engineering workers.

Key words: Indoor air quality, Nosocomial infection control, Wind tunnel test