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Volatile Organic Compound Concentrations in a Hemodialysis Room in a Medium City of South Korea

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Purpose : It is well known that outdoor environmental pollution causes bad effect on human health. Recently not only outdoor but indoor air pollution is becoming an issue. And those who stay long time in hemodialysis (HD) room; ESRD patients and medical teams has relatively increased chance of being exposured to indoor volatile organic compounds. This study was designed to find out whether the indoor air pollution in a HD room is different from that of other comparable areas in a hospital.

Methods : Because of their potential to cause adverse health effect, benzene and toluene were chosen for analysis. Total forty air samples were taken in the HD room and a nursing station in a nearby general ward between May 29-31, 2006, in Soonchunhyang Chunan Hospital. Five air samplers were hung on ceiling and another five were placed on the top of tables and additional five samplers were placed on the breathing zone of nurses in both HD room and general ward. Separately 10 air samplers were placed on the edge of the bed in HD rooms to represent the breathing zone for the HD patient. Each of the air monitor samplers were placed for 72 hours. Temperature, humidity were also recorded. Benzene and toluene were analyzed by GC/MS.

Results : In the general ward, toluene concentration were significantly higher in the nurse breathing zone than in the ceiling or table samples (p=0.001). Toluene concentrations in HD room showed no significant difference. The benzene concentration was significantly higher in the general ward nurse breathing zone than in the HD (p=0.006). In addition, the benzene concentrations on the table were higher at the general ward compared to the HD (p=0.028). Ceiling benzene concentration showed no significant difference between the general ward and HD room.

Conclusion : Both benzene and toluene concentrations in the HD appear to be affected more by outdoor atmospheric conditions than indoor internal sources.