

A Refrigerated Condition for the Storage of Glucose Test Strips at Health Promoting Hospitals: An Implication for Hospitals with Limited Air Conditioners

Authors : Wanutchaya Duanginta, Napaporn Apiratmateekul, Tippawan Sangkaew, Sunaree Wekinhirun, Kunchit Kongros, Wanvisa Treebuphachatsakul

Abstract : Thailand has a tropical climate with an average outdoor ambient air temperature of over 30°C, which can exceed manufacturer recommendations for the storage of glucose test strips. This study monitored temperature and humidity at actual sites of five sub-district health promoting hospitals (HPH) in Phitsanulok Province for the storage of glucose test strips in refrigerated conditions. Five calibrated data loggers were placed at the actual sites for glucose test strip storage at five HPHs for 8 weeks between April and June. For the stress test, two lot numbers of glucose test strips, each with two glucose meters, were kept in a plastic box with desiccants and placed in a refrigerator with the temperature calibrated to 4°C and at room temperature (RT). Temperature and humidity in the refrigerator and at RT were measured every hour for 30 days. The mean temperature for storing test strips at the five HPHs ranged from 29°C to 33°C, and three of the five HPHs (60%) had a mean temperature above 30°C. The refrigerator temperatures were $3.8 \pm 2.0^\circ\text{C}$ (2.0°C to 6.5°C), and relative humidity was $51 \pm 2\%$ (42 to 54%). The maximum of blood glucose testing by glucose meters when the test strips were stored in a refrigerator were not significantly different ($p > 0.05$) from unstressed test strips for both glucose meters using amperometry-GDH-PQQ and amperometry-GDH-FAD principles. Opening the test strip vial daily resulted in higher variation than when refrigerated after a single-use. However, the variations were still within an acceptable range. This study concludes that glucose tested strips can be stored in plastic boxes in a refrigerator if it is well-controlled for temperature and humidity. Storage of glucose-tested strips in the refrigerator during hot and humid weather may be useful for HPHs with limited air conditioners.

Keywords : environmental stressed test, thermal stressed test, quality control, point-of-care testing

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