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EVALUATION

AREEPHAN ANUCHAPREEDA ; BLOOD PRESSURE EVALUATION OF
DIFFERENT AUTOMATED OSCILLOMETRIC DEVICES. THESIS ADVISORS :
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Systemic Blood Pressure is an important factor for physician to detect and decide the most appropriate treatment for critically ill patients. The major objective of this study is to evaluate blood pressure readings on nine oscillometric devices with indirect oscillometric technique from four different automated oscillometric models ; Dinamap 8100, Dinamap 1846SX, Omega1400series, and Hewlett Packard 78353C, by comparing oscillometric readings with simultaneous direct intra-arterial pressure readings. The purposive sampling technique was applied to the study population, which consists of 78 patients undergoing intra-arterial line catheterization at intensive care unit, Tung-Trong – Chit 1, Siriraj hospital.

Comparison between readings, obtained from direct and oscillometric method by paired t-test, suggest that Dinamap 8100 produces similarly readings of “triplet” (SBP, DBP, MAP) at a significant level .05 ($p > .05$). Dinamap 1846SX, Omega 1400 series and Hewlett Packard 78353C present significantly different levels .05 ($p < .05$). The correlation coefficient is a positive value between 0.6-0.9. Dinamap 1846SX shows the best relationship with direct readings in the triplet at 0.877, 0.886 and 0.901 for SBP, DBP and MAP respectively, and found to be the device with the best predictable efficiency of triplet with the lowest standard error of the estimate (SEE). Dinamap 8100 had the highest SEE of triplet. The findings also show that oscillometric SBP readings are under-read by 9.20 mmHg with exceeds the AAMI standard (mean difference must be within 5 mmHg). Thus all models are unacceptable in clinics. Oscillometric DBP readings are 3.49 over direct DBP readings and are acceptable in clinics except for the Omega model. Oscillometric MAP readings are 2.11 mmHg over direct readings and can be accepted in clinics.

The relationship between the readings obtained from the two methods show that oscillometric SBP readings are lower than the true value and the mean difference exceeds the AAMI standard. Nevertheless, oscillometric DBP and MAP readings are within the acceptable interval of AAMI standards. Thus these automated oscillometric blood pressure measurement devices can be further used in the role of a labour-saving monitoring device.

The results of this study show that the majority of the tested devices produce acceptable values which can be used in a monitoring function and a minority produce unacceptable values. Although Dinamap 8100 produce non-significant readings of SBP, DBP, and MAP. However it does not indicate that every machine in this model can produce non-significant readings the same way as the machine in this study. Therefore it cannot be considered a representative result in this model. Studying with a greater sample size is required.