RELIABILITY AND VALIDITY OF CHOLESTEROL POINT-OF-CARE TESTING

AP43

Tania Gayle Robert Lourdes*, Hamizatul Akmal Abd Hamid, Thamil Arasu Saminathan, Halizah Mat Rifin, Mohd Ruhaizie Riyadzi, Hasimah Ismail, Wan Kim Sui, Kishwen Kanna Yogaratnam, Mohd Azmi Suliman, Muhammad Fadhli Mohd Yusoff.

Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia

INTRODUCTION

Point-of-care testing (POCT) for the measurement of elevated blood cholesterol levels (total cholesterol only) in the community has been used since 2011, in the National Health and Morbidity Survey (NHMS) (1). Measurement of all parameters; total cholesterol (TC), triglycerides (TG), high density lipoprotein (HDL) and low-density lipoprotein (LDL) could be used to derive the Framingham risk assessment score that could determine the 10-year cardiovascular risk of the patient (2). This study aimed to determine reliability and validity of Mission Cholesterol Meter in the measurement of all blood cholesterol parameters.

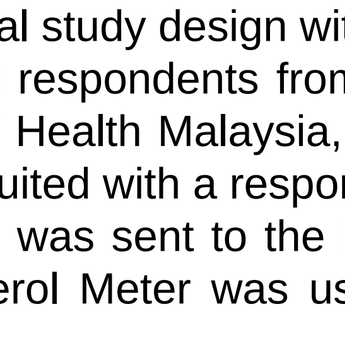
Table 1: Lab cut offs used in this study (3)

- Total cholesterol (TC) 5.2 mmol/l or more
- HDL-C < 1.0 mmol/l (males); < 1.2 mmol/l (females)
- TG > 1.7 mmol/l
- LDL-C > 2.6 mmol/l

METHODS

- Cross sectional study design with quota sampling.
- A total of 203 respondents from a research center under Ministry of Health Malaysia, aged 18 years and above, were recruited with a response rate of 96.5%.
- Venous blood was sent to the laboratory while the Mission Cholesterol Meter was used to test capillary blood.
- Intraclass Coefficient Correlation (ICC) analysis was employed to determine the agreement between capillary and venous blood readings.
- Diagnostic performance was measured using sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).
- Descriptive analysis and reliability analysis using ICC were employed. All data were analysed using SPSS version 27.

RESULTS



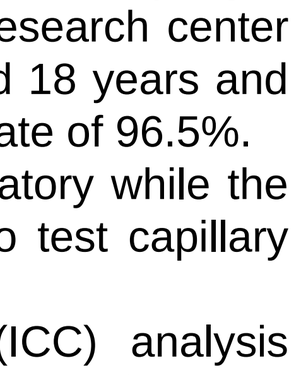
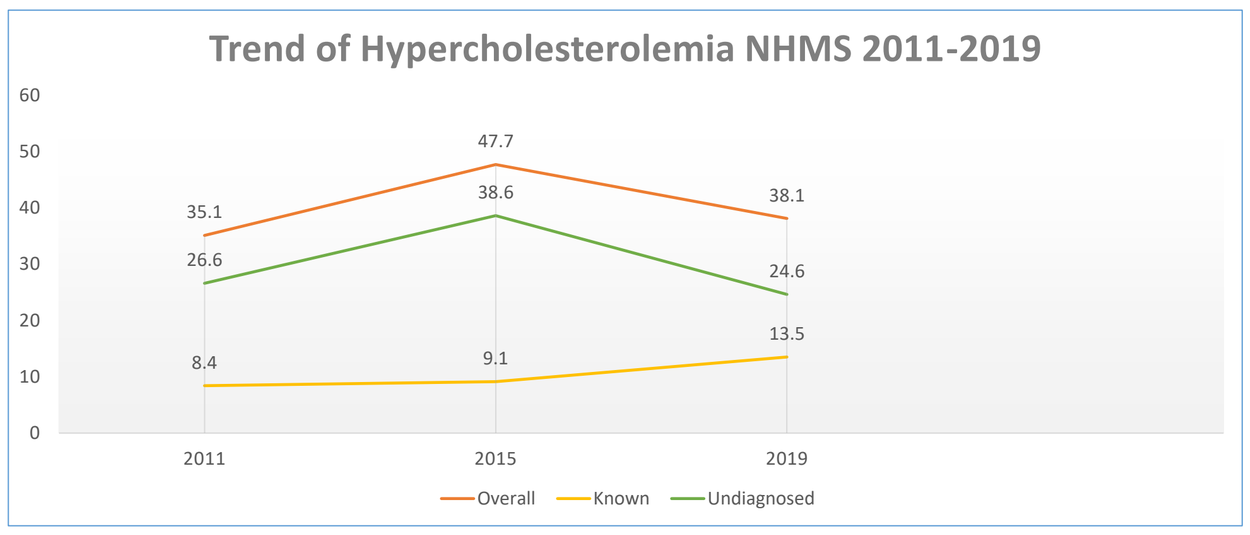


Table 2: Descriptive results of respondents

	n	%
Overall (n)	196	
Sex		
Male	49	23.20%
Female	147	76.80%
Age		
18-39 years	112	54.60%
40-59 years	72	35.10%
60 years and above	12	5.90%



Line chart 1: Trend of Hypercholesterolemia among adults (18 years and above) (4)

Table 3: General characteristics of samples tested by Mission Cholesterol Meter

	Total Cholesterol	Triglycerides	HDL	LDL
Mean (%) ± SD	4.47 ± 1.16	1.47 ± 0.78	1.24 ± 0.43	2.58 ± 1.01
Minimum	2.58	0.56	0.49	0.72
Maximum	7.81	5.58	3.13	6.03

Table 4: Diagnostic performance of Mission Cholesterol Meter

Capillary vs Venous	Sensitivity (%)	Specificity (%)	Positive Predictive Value (PPV)	Negative Predictive Value (NPV)
Total Cholesterol	47.2	100	100	61.6
Triglycerides	88.6	90.1	66.0	97.3
HDL	85.2	59.2	25.0	96.2
LDL	62.8	96.6	97.7	52.8

Table 5: Agreement between capillary blood (Mission Cholesterol Meter) versus venous blood (lab) using Intraclass Correlation Coefficient analysis

Capillary versus Lab	Agreement	p value
Total Cholesterol	0.668 (-0.041, 0.874)	<0.001
Triglycerides	0.826 (0.694, 0.893)	<0.001
HDL	0.488 (0.241, 0.651)	<0.001
LDL	0.706 (-0.058, 0.899)	<0.001

DISCUSSION

- The Mission Cholesterol Meter is a commercially available self-testing POCT, not only for the measurement of total cholesterol but also TG, HDL and calculated LDL levels.
- In this study, the device proved moderate reliability between capillary and venous blood for TC, HDL, and LDL whereas good reliability for TG.
- In a study comparing several self-test devices, Mission Cholesterol Meter was one of the devices that was able to measure all parameters of cholesterol along with being portable and hand-held (5).

CONCLUSION

- This analyser is a reliable and valid POCT that can be utilised in epidemiological studies as well as in remote areas with restricted access to laboratories.
- Cardiovascular risk could be estimated in the Malaysian population when utilised in nationwide studies.

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