Abstract for Director’s Day

**Calculation of age and gender related non-HDL-C percentiles from Health Survey for England data – Implications for diagnosis of Familial Hypercholesterolaemia (FH)**

Joy Allen1, Michael Power1, John Simpson1 , Julie Day2, Jennifer S Mindell3, Shaun Scholes3, Dermot Neely1,2

1 NIHR Diagnostic Evidence Co-operative Newcastle, 2 Department of Clinical Biochemistry, Newcastle upon Tyne Hospitals NHS Foundation Trust, 3Health and Social Surveys Research Group, Research Department of Epidemiology & Public Health, UCL

Background

Familial Hypercholesterolaemia (FH) is a genetic disorder characterised by high LDL-cholesterol levels causing premature cardiovascular disease. Phenotypic scoring systems such as the Dutch Lipid Clinic Network Score (DLNCS) or the Simon Broome Criteria (SBC) are recommended for selection of patients with a high likelihood of having monogenic FH. These criteria all incorporate the index case’s personal and family history, physical signs and LDL-C concentration. The specific LDL-C thresholds applied are independent of age and gender however, FH diagnosis may be improved by the use of percentile cholesterol thresholds based on nationally-representative population data.

Methods

Data from the 2003 the Health Survey for England (HSE), Cardiovascular Disease survey were used to derive age and gender specific non-HDL-C percentiles. This analysis was extended to further years and then applied to the results of a recent project to improve referral for FH genetic testing in the North East, North Cumbria region.

Results

Non-HDL-C distributions derived from the HSE show remarkable consistency across years and confirm there is a strong dependence of non-HDL-C both on age and gender.

Discussion

A non-HDL-C concentration of 5.7mmol/L can be considered equivalent to a Friedewald calculated LDL-C of 4.9 mmol/L in patients with a normal fasting triglyceride of ≤1.7 mmol/L. This corresponds to the adult diagnostic threshold for FH according to the SBC and yields a score of 3 in the DLNCS. Our data show that for males aged 35-64, this values lies close to the 90th centile for non-HDL-C but is above the 99th centile for females aged 16-24. The use of this single threshold is likely to lead to under-diagnosis in males <35 and females <45, as well as over-diagnosis in females > 55.

Conclusions

Incorporation of age and gender specific non-HDL-C percentiles into UK based FH scoring systems could potentially improve the sensitivity and specificity for FH diagnosis and refine the selection of index cases for targeted genetic testing.