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

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

The Health Survey for England data (2003 – 2014) was used to estimate gender specific total and non-HDL Cholesterol age distributions for healthy adults (>16). Using LMS procedures, we have created smoothed curves demonstrating population based 90th, 97.5th, 99th, 99.5th percentiles.

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

The current LDL-C cholesterol threshold of 4.9mmol/L used for diagnosing FH is applied irrespective of age and gender, which corresponds to a non-HDL-C concentration of 5.7mmol/L (Freidewald calculation). The value used (4.9mmol/L) is lies close to the 90th percentile derived from HSE data for males aged 35-64, but is above the 99th centile for females aged 16-24. Use of this single threshold for diagnosing FH 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.