

143. Sex-Specific U-Shaped Relationships of High-Density Lipoprotein Cholesterol Levels to 10-Year Major Adverse Cardiovascular Events: A Nationwide Cohort Study of 5.7 Million South Koreans

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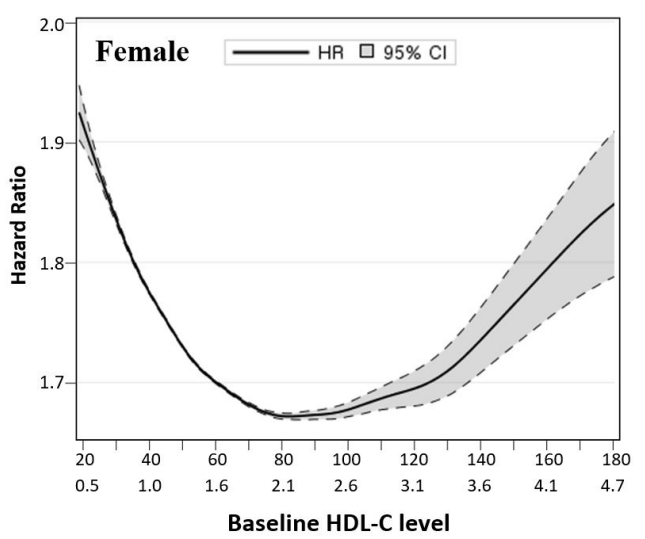
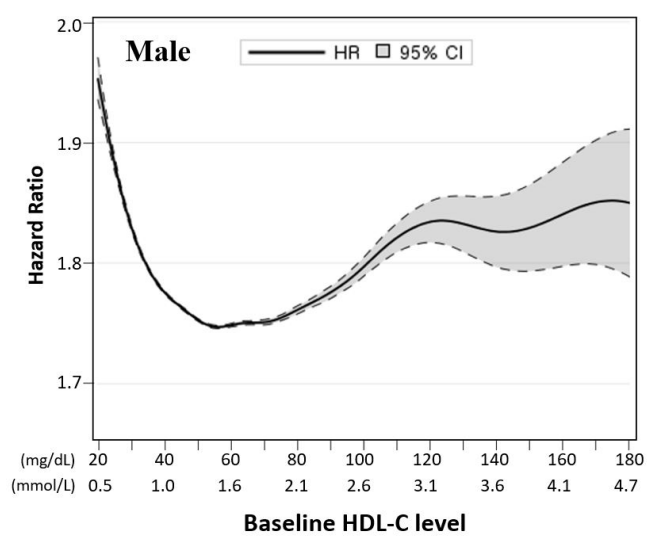
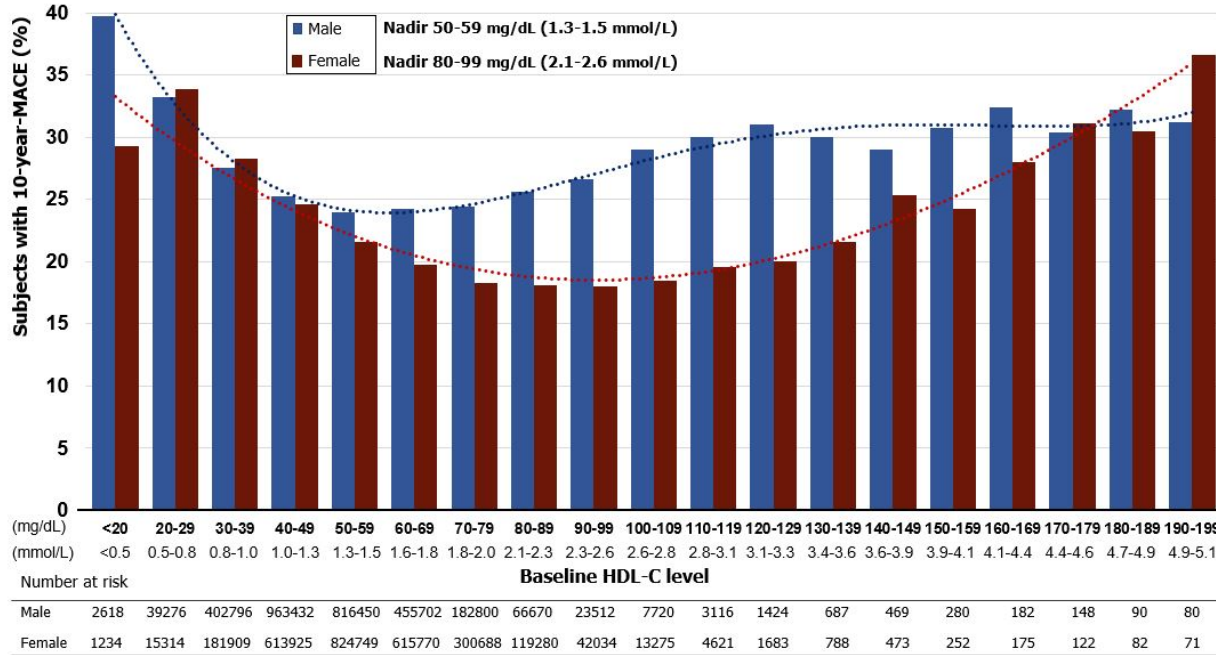
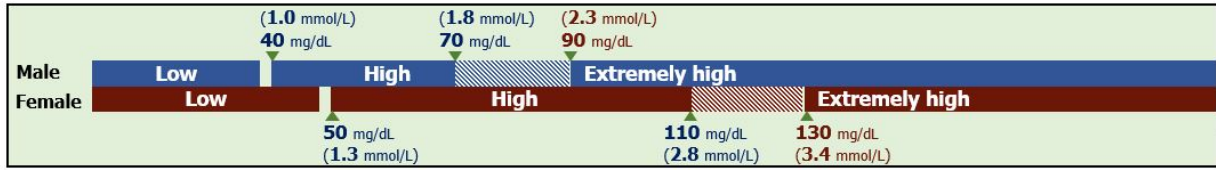
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Background: High-density lipoprotein cholesterol (HDL-C) is a well-known negative predictor of atherosclerotic cardiovascular diseases (ASCVD); risks from extremely high HDL-C are unclear. We explored the relationship between HDL-C levels and 10-year major adverse cardiovascular events (10-yr MACE), providing sex-specific upper reference points of HDL-C levels for risk management.

Methods: Using the Korean National Health Insurance Sharing Service, we identified 5,703,897 subjects (age 53 ± 10 years, female 48%) who underwent health checkups in 2009 with age ≥ 40 years, eligible HDL-C results, and no prior ASCVD. We investigated the distribution of 10-yr MACE according to HDL-C levels in 10 mg/dL [0.26 mmol/L] intervals and in three categorized HDL-C groups (low: males < 40 mg/dL [1.03 mmol/L], females < 50 mg/dL [1.29 mmol/L]; high: males 40-90 mg/dL [1.03-2.33 mmol/L], females 50-90 mg/dL [1.29-2.33 mmol/L]; and extremely high: > 90 mg/dL [2.33 mmol/L]).

Results: There were U-shaped relationships between HDL-C levels and 10-yr MACE with later inflection in females than in males (nadir: 80 - 99 mg/dL [2.07 - 2.56 mmol/L] and 50 - 59 mg/dL [1.29 - 1.53 mmol/L], respectively) (Fig. 1). In males, the extremely high HDL-C group, like the low group, showed significantly higher 10-yr MACE than the high group (28.1% vs. 24.6%, $P < 0.0001$). In females, the extremely high group showed the lowest 10-yr MACE; when the extremely high starting point was raised to 130 mg/dL (3.36 mmol/L), the pattern became similar to that in males and showed higher 10-yr MACE than the high group (25.6% vs. 20.1%, $P < 0.0001$). Likewise, cubic spline models showed U shapes for males and females on a continuous scale of HDL-C levels with later upward inflection in females (Fig. 2).

Conclusion: The 10-yr MACE showed a U-shaped relationship with HDL-C levels in Koreans. Extremely high HDL-C level at 90 mg/dL (2.33 mmol/L) in males was corresponding in risk to 130 mg/dL (3.36 mmol/L) in females.



Clinical Implications: My study will help enable cardiovascular clinicians to understand that there are increasing sex-specific cardiovascular risks associated with extremely high HDL cholesterol levels.