



Validity of non-high-density lipoprotein cholesterol for detecting dyslipidemia among Korean adolescents

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Introduction

Non-high-density lipoprotein (HDL) cholesterol is an alternative method to assess dyslipidemia. We aimed to assess the **validity of non-HDL cholesterol for detecting dyslipidemia** using data from the Korean National Health and Nutrition Examination Surveys (KNHNES) during 2008-2016.

Subjects and Methods

1. Study population

- data from the KNHANES 2008-2016.
- **total 6,989 youth** (3,684 boys and 3,305 girls) **aged 10-19 years.**

2. Health examination and health interview survey

- Height, weight, body mass index
- Total cholesterol, triglyceride, and HDL-cholesterol
- Measured LDL-cholesterol and calculated LDL-cholesterol

3. Criteria of dyslipidemia based on National Heart, Lung, and Blood institute (NHLBI)

mg/dL	Acceptable	Borderline	Abnormal
Total cholesterol	<170	170-199	≥200
Non-HDL cholesterol	<120	120-144	≥145
LDL cholesterol	<110	110-129	≥130
Triglyceride			
0-9 years	<75	75-99	≥100
10-19 years	<90	90-129	≥130
HDL cholesterol	>45	40-45	<40

Results

Table 1. Clinical characteristics of subjects

	Boys	Girls	Total
Number	3,684	3,305	6,989
Age (years)	14.6 ± 0.1	14.6 ± 0.1	14.6 ± 0.1
Height SDS	0.00 ± 0.19	0.18 ± 0.02	0.09 ± 0.10
Weight SDS	0.02 ± 0.06	0.06 ± 0.02	0.04 ± 0.03
BMI SDS	-0.10 ± 0.05	-0.05 ± 0.03	-0.08 ± 0.02

Table 2. Prevalence of dyslipidemia among Korean children and adolescents

	Boys	Girls	Total
Total cholesterol ≥200 mg/dL	5.8 ± 0.4	9.1 ± 0.5	7.3 ± 0.3
Non-HDL cholesterol ≥145 mg/dL	7.1 ± 0.5	8.5 ± 0.5	7.8 ± 0.4
Measured LDL-C ≥130 mg/dL	8.2 ± 1.6	9.1 ± 1.6	8.6 ± 1.2
Calculated LDL-C ≥130 mg/dL	4.3 ± 0.3	6.4 ± 0.5	5.3 ± 0.3
Triglyceride ≥130 mg/dL	13.9 ± 0.7	12.5 ± 0.6	13.3 ± 0.5
HDL-cholesterol <40 mg/dL	15.7 ± 0.7	9.1 ± 0.9	12.6 ± 0.5

Table 3. Teenage boys aged 10-19 years

Measured LDL-C	Non-HDL cholesterol			Measured LDL-C	Total cholesterol		
	normal	abnormal	total		normal	abnormal	total
normal	401	18	419	normal	407	12	419
	96.3	3.7	100		97.7	2.3	100
abnormal	2	33	35	abnormal	9	26	35
	3.7	96.3%	100		23.1	76.9%	100
total	403	51	454	total	416	38	454
<i>P</i> <0.001	88.7	11.3	100	<i>P</i> <0.001	91.6	8.4	100

Data are presented as number and %.
P value was obtained by chi-square test.

Table 4. Teenage girls aged 10-19 years

Measured LDL-C	Non-HDL cholesterol			Measured LDL-C	Total cholesterol		
	normal	abnormal	total		normal	abnormal	total
normal	387	14	401	normal	391	10	401
	97.1	2.9	100		97.5	2.5	100
abnormal	3	36	39	abnormal	5	34	39
	4.8	95.2%	100		8.6	91.4%	100
total	390	50	440	total	396	44	440
<i>P</i> <0.001	88.7	11.3	100	<i>P</i> <0.001	89.3	10.7	100

Data are presented as number and %.
P value was obtained by chi-square test.

Conclusions

- The prevalence of non-HDL cholesterol level ≥145 mg/dL were 7.1% and 8.5% in teenage boys and girls, respectively.
- High non-HDL cholesterol level **detected high measured LDL-cholesterol level with high sensitivity and high specificity.**
- Screening dyslipidemia **using non-HDL cholesterol level was more useful than using total cholesterol level alone**, especially in detecting high LDL cholesterol level.
- **Non-HDL cholesterol appeared to be a reliable dyslipidemia screening test also in adolescents.**
- Further studies using “non-fasting” non-HDL cholesterol are needed.

