심혈관질환 예방을 위한 임상영양 –콜레스테롤을 중심으로–

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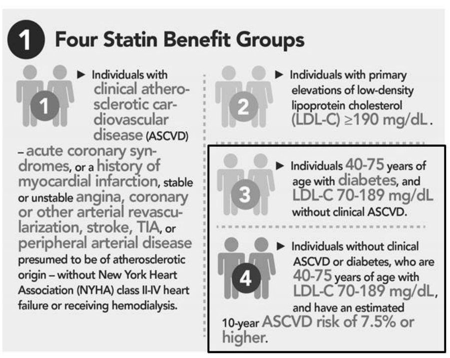
Focus on ASCVD Risk Reduction: 4 statin benefit groups



한국지질동맥경화학회, 2015 이상지질혈증 치료지침

표 2-2. 위험도 및 LDL 콜레스테롤 농도에 따른 치료의 기준

위험도	LDL 콜레스테롤 농도				
	70-99	100-129	130-159	160-189	≥190
초고위험군* 관상동맥질환 허혈성 뇌졸중 일과성 뇌허혈발작 말초혈관질환	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작
고위험군 경동맥질환† 복부동맥류 당뇨병	생활습관 개선 및 투약고려	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작
중등도 위험군§ 주요위험인자 2개 이상	생활습관 개선	생활습관 개선 및 투약고려	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작
저위험군§ 주요위험인자 1개 이하	생활습관 개선	생활습관 개선	생활습관 개선 및 투약고려	생활습관 개선 및 투약시작	생활습관 개선 및 투약시작

*급성심근경색 발생 시 기저치의 LDL 콜레스테롤 농도와 상관 없이 바로 스타틴을 투약한다. 급성심근경색 이외의 초고위험군의 경우 LDL 콜레스테롤 70 mg/dL 미만에서도 스타틴 투약을 고려할 수 있다.

†50%가 넘는 경동맥 협착이 확인된 경우

§ 중등도 위험군과 저위험군의 경우는 수주 혹은 수개월간 생활습관 개선을 시행한 뒤에도 LDL 콜레스테롤 농도가 높을 시 스타틴 투약을 고려한다.

식이요법 지침

	NCEP-ATP III (2001)	ESC/EAS (2011)
총지방량	총칼로리의 25-35%	총칼로리의 25-35%
포화지방산	총칼로리의 7% 미만	총칼로리의 10% 미만 (고지혈증이 있는 경우 7%)
다가불포화지방산	총칼로리의 10% 까지	포화지방산을 불포화지방산으로 대체하되, n-6 다가불포화지방산은 총칼로리의 10% 이내가 되도록
단일불포화지방산	총칼로리의 20% 까지	
트랜스지방		총칼로리의 1% 미만으로
콜레스테롤	하루 200mg 이하	하루 300mg 이하
칼로리	표준 체중을 유지할 정도	적정 체중을 유지할 정도
탄수화물	총칼로리의 50-60%	총칼로리의 45-55% (sugar는 10%를 넘지 않도록)
단백질	총칼로리의 15% 정도	
섬유소	하루 20-30g	25-40g

Summary of Recommendations for Lifestyle Management

(2013 AHA/ACC Guideline)

Recommendations	NHLBI Grade	NHLBI Evidence Statements	ACC/AHA COR	ACC/AHA LOE
DIET				
LDL–C - Advise adults who would benefit from LDL–C lowering* to:				
1. Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats. a. Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes mellitus). b. Achieve this pattern by following plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.	A (Strong)	CQ1: ES4 (high), ES6 (low), ES8 (moderate), ES9 (moderate)	I	A
2. Aim for a dietary pattern that achieves 5% to 6% of calories from saturated fat.	A (Strong)	CQ1: ES11(high)	I	A
3. Reduce percent of calories from saturated fat.	A (Strong)	CQ1: ES11(high), ES12 (moderate), ES13 (moderate)	I	A
4. Reduce percent of calories from *trans* fat.	A (Strong)	CQ1: ES14 (moderate), ES15 (moderate)	I	A

BP - Advise adults who would benefit from BP lowering to:				
1. Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats. a. Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes mellitus). b. Achieve this pattern by following plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.	A (Strong)	**CQ1:** ES1 (low) ES3 (high), ES5 (high), ES6 (low), ES7 (low), ES8 (moderate)	I	A
2. Lower sodium intake.	A (Strong)	**CQ2:** ES1 (high), ES2 (moderate), ES3 (high), ES4 (high), ES5 (high), ES8 (low), ES9 (low)	I	A
3. a. Consume no more than 2,400 mg of sodium/day; b. Further reduction of sodium intake to 1,500 mg/day is desirable since it is associated with even greater reduction in BP; and c. Reduce intake by at least 1,000 mg/day since that will lower BP, even if the desired daily sodium intake is not yet achieved.	B (Moderate)	**CQ2:** ES2 (moderate), ES3 (high)	IIa	B
4. Combine the DASH dietary pattern with lower sodium intake.	A (Strong)	**CQ1:** ES3 (high), ES5 (high), ES8 (moderate) **CQ2:** ES1 (high), ES2 (moderate), ES3 (high), ES4 (high), ES5 (high), ES6 (moderate)	I	A

Saturated Fat

ES11.

- When food was supplied to adults in a dietary pattern that achieved a macronutrient composition of 5% to 6% saturated fat, 26% to 27% total fat, 15% to 18% protein, and 55% to 59% carbohydrate compared to the control diet (14% to 15% saturated fat, 34% to 38% total fat, 13% to 15% protein, and 48% to 51% carbohydrate) LDL–C was lowered 11–13 mg/dL in 2 studies, and 11% in another study.

Strength of Evidence: High

ES12.

- In controlled feeding trials among adults, for every 1% of energy from SFA that is replaced by 1% of energy from carbohydrate, MUFA, or PUFA:
  - LDL–C is lowered by an estimated 1.2, 1.3, and 1.8 mg/dL, respectively.
  - HDL–C is lowered by an estimated 0.4, 1.2, and 0.2 mg/dL, respectively.
- For every 1% of energy from SFA that is replaced by 1% of energy from:
  - Carbohydrate and MUFA, TG are raised by an estimated 1.9 and 0.2 mg/dL, respectively.
  - PUFA, TG are lowered by an estimated 0.4 mg/dL.

Strength of Evidence: Moderate

ES13.

- In controlled feeding trials among adults, for every 1% of energy from carbohydrate that is replaced by 1% of energy from:
  - MUFA, LDL–C is lowered by 0.3 mg/dL, HDL–C is raised by 0.3 mg/dL, and TG are lowered by 1.7 mg/dL.
  - PUFA, LDL–C is lowered by 0.7 mg/dL, HDL–C is raised by 0.2 mg/dL, and TG are lowered by 2.3 mg/dL.

Strength of Evidence: Moderate

Trans Fat

ES14.

- In controlled feeding trials among adults, for every 1% of energy from *trans* monounsaturated fatty acids replaced with 1% of energy from:
  - MUFA or PUFA, LDL–C is lowered by 1.5 mg/dL and 2.0 mg/dL, respectively.
  - SFA, MUFA, or PUFA, HDL–C is increased by an estimated 0.5, 0.4 and 0.5 mg/dL, respectively. MUFA or PUFA, TG is decreased by an estimated 1.2 and 1.3 mg/dL.

Strength of Evidence: Moderate

ES15.

- In controlled feeding trials among adults, the replacement of 1% of energy as *trans* monounsaturated fatty acids with carbohydrate decreased LDL–C cholesterol levels by 1.5 mg/dL, and had no effect on HDL–C cholesterol and TG.

USDA

Scientific Report of the
2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture

Cholesterol. Previously, the Dietary Guidelines for Americans recommended that cholesterol intake be limited to no more than 300 mg/day. The 2015 DGAC will not bring forward this recommendation because available evidence shows no appreciable relationship between consumption of dietary cholesterol and serum cholesterol, consistent with the conclusions of the AHA/ACC report.[2, 35] Cholesterol is not a nutrient of concern for overconsumption.

심뇌혈관질환 예방을 위한 식생활지침

(가정의학회, 2011)

5. 정제된 탄수화물보다는 전곡을 선택해 먹습니다.
   - 섬유질이 많은 전곡은 비만과 심혈관질환의 예방 효과가 있습니다.
   - 백미밥보다는 현미와 잡곡밥을 먹습니다.
   - 흰밀가루보다는 통밀이나 호밀로 만든 식품을 선택합니다.
6. 다양한 채소와 과일을 매일 충분히 먹도록 합니다.
   - 채소에는 식이섬유와 비타민, 미네랄이 풍부하므로 매 식사마다 충분히 먹습니다.
   - 과일은 섭취 열량이 높아질 수 있으므로 과하게 먹지는 않도록 합니다.
7. 생선을 최소한 주 2회 이상 먹도록 합니다.
   - 등푸른 생선에는 불포화지방산이 많아 심뇌혈관질환 예방에 도움이 됩니다.
   - 염장이나 조림 생선은 소금 함량이 많으므로 되도록 굽거나 쪄서 먹습니다.
8. 간식으로 저지방유제품을 먹도록 합니다.
   - 우유는 우리나라 사람에게 가장 부족한 영양소 중 하나인 칼슘이 풍부합니다.
   - 과다한 지방 섭취를 피하기 위해 저지방 제품을 선택합니다.

Conclusion

- The effect of dietary cholesterol on incident CAD and serum cholesterol outcomes remains unclear.
- Intervention trials showed a statistically significant increase in total, LDL, and HDL cholesterol when comparing intervention doses of 500–900 mg/d dietary cholesterol with control doses.
- Lower intake of dietary cholesterol has been recommended by some to optimize clinical outcomes or prevent incident CAD; however, there is a lack of longitudinal data (observational or trials) to support such a recommendation.
- It is therefore imperative that longitudinal observational studies are conducted with frequent exposure ascertainment and appropriate control for potential dietary confounders.

(Berger et al. *Am J Clin Nutr* 2015;102:276–94)