

Re: High cholesterol protective against infection?

Source: <http://sci.tech-archive.net/Archive/sci.med.nutrition/2006-08/msg00057.html>

- *From:* Matti Narkia <mna@xxxxxxxx>
 - *Date:* Thu, 03 Aug 2006 23:26:00 +0300
-

On Thu, 3 Aug 2006 22:34:23 +0300, "Juhana Harju" <shantigiriorama@xxxxxxxx> wrote:

Matti Narkia wrote:

: On 3 Aug 2006 09:52:02 -0700, "Ron Peterson" <ron@xxxxxxxxxxxxxxxx>
: wrote:

:: Susan wrote:

::

::: Lipopolysaccharide, or endotoxin, the main pathogenic factor of
::: Gram-negative bacteria, binds rapidly to lipoproteins,6 mainly
::: LDL,7 and lipoprotein-bound endotoxin is unable to activate the
::: secretion of various cytokines by monocytes in vitro.6,7,10 Also,
::: Staphylococcus aureus {alpha}-toxin, a toxin produced by most
::: pathogenic Staphylococcus strains and causing damage to a wide
::: variety of cells, is bound and almost totally inactivated by human
::: serum and purified LDL, as estimated by haemolytic titration.3"

::

::: Is there an hypothesis that bacteria are one of the main causes of
::: cardiovascular disease?

::

: There is a hypothesis about inflammation being a causative factor.
: Infection is one of the causes of inflammation. Infection may be
: caused by virus, bacteria, fungi or any other pathogens foreign to our
: bodies. Low grade systemic inflammation can persist even when there
: are no foreign pathogens, the cause can also be internal.

:

::: If so, would that explain why Italy has a lower incidence of
::: cardiovascular disease because of their overuse of antibiotics?

:

: Perhaps life style factors such as Mediterranean diet could have
: greater effect, IMHO, although Italian diet is probably not as good as
: Cretan traditional Mediterranean diet. I'm not familiar with the
: Italian overweight and obesity statistics, but if they are better than
: average, that could be part of the reason.

hs-CRP is a inflammatory marker and to my knowledge the largest reductions
in hs-CRP has been achieved by the low fat Pritikin diet (combined with
exercise).

Re: High cholesterol protective against infection?

I doubt that (and even if true it's surely not an explanation for Italy's claimed lower incidence of cardiovascular disease :-)), see

Meksawan K, Venkatraman JT, Awad AB, Pendergast DR.
Effect of dietary fat intake and exercise on inflammatory mediators of the immune system in sedentary men and women.
J Am Coll Nutr. 2004 Aug;23(4):331-40.
PMID: 15310737 [PubMed – indexed for MEDLINE]
<<http://www.jacn.org/cgi/content/full/23/4/331>>

"CONCLUSION: While a short, intense bout of exercise increased pro-inflammatory mediators of the immune system, decreasing fat intake to 19% on a caloric deficient diet caused a greater increase in plasma TNF- α , sVCAM-1 and sICAM-1 concentration than the 30% and 50% fat diets in male and female subjects. Increasing fat calories to 50% with caloric balance did not exacerbate pro-inflammatory mediators compared to a 30% fat diet.

[...]

In conclusion, a short and maximal exercise bout resulted in an increase in the number of circulating leukocytes, neutrophils, lymphocytes and monocytes. The concentrations of plasma TNF- α , IL-2, and sVCAM-1 and the IL-1 β and IL-6 production of PBMC cells stimulated with LPS were also increased in response to maximal exercise. Exercise on the 19% fat diet may have a greater tendency to induce an inflammatory response, when compared to the 50% fat diet as plasma TNF- α , sVCAM-1 increased more and sICAM-1 increased only on the 19% fat diet. The results from the present study suggest that post-exercise inflammatory response may be reduced by selecting a diet that provides sufficient caloric intake to match with the energy requirement and has a composition of at least 30% fat. In addition, if caloric balance is maintained, increasing fat intake (up to 50%) may not be harmful to immune status in healthy sedentary and athletic individuals.

and

Venkatraman JT, Feng X, Pendergast D.
Effects of dietary fat and endurance exercise on plasma cortisol, prostaglandin E2, interferon- γ and lipid peroxides in runners.
J Am Coll Nutr. 2001 Oct;20(5):529-36.
PMID: 11601568 [PubMed – indexed for MEDLINE]
<<http://www.jacn.org/cgi/content/full/20/5/529>>

"Results: Pre-exercise levels of plasma cortisol were elevated, IFN- γ was unchanged and PGE2 and lipid peroxides decreased on the 40%F diet compared to 30%F and 15%F. Post-

Re: High cholesterol protective against infection?

exercise levels of plasma cortisol ($p < 0.004$), PGE2 ($p < 0.0057$) and lipid peroxide levels increased ($p < 0.0001$) after endurance exercise on all diets. The rates of increase of plasma cortisol levels during exercise were similar on all three diets. Although absolute cortisol levels were higher in the high fat group, the rate of increase of plasma cortisol level during exercise was similar on each diet. The dietary fat levels did not affect IFN- γ , however, PGE2 and lipid peroxides decreased with increasing fat at baseline at 40%F level ($p < 0.01$; 30%F vs. 40%F: $p < 0.002$; 15%F vs. 40%F: $p < 0.007$).

Conclusions: Data from the present study suggest that higher levels of fat in the diet, up to 40%, increase endurance running time without adverse effects on plasma cortisol, IFN- γ , and lipid peroxide levels."

Here's another interesting study about exercise and inflammation:

Petersen AM, Pedersen BK.

The anti-inflammatory effect of exercise.

J Appl Physiol. 2005 Apr;98(4):1154-62. Review.

PMID: 15772055 [PubMed - indexed for MEDLINE

<http://jap.physiology.org/cgi/content/full/98/4/1154>

"In conclusion, regular exercise protects against diseases associated with chronic low-grade systemic inflammation. This long-term effect of exercise may be ascribed to the anti-inflammatory response elicited by an acute bout of exercise, which is partly mediated by muscle-derived IL-6. Physiological concentrations of IL-6 stimulate the appearance in the circulation of the anti-inflammatory cytokines IL-1ra and IL-10 and inhibit the production of the proinflammatory cytokine TNF- α . Moreover, IL-6 stimulates lipolysis as well as fat oxidation. The anti-inflammatory effects of exercise may offer protection against TNF-induced insulin resistance. Recently, our group proposed that IL-6 and other cytokines, which are produced and released by skeletal muscles, exerting their effects in other organs of the body, should be named myokines (99). Here we suggest that myokines may be involved in mediating the health-beneficial effects of exercise and play important roles in the protection against diseases associated with low-grade inflammation."

—

Matti Narkia

.