

## Re: High cholesterol protective against infection?

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- *From:* "Juhana Harju" <[shantigiriorama@xxxxxxxxxx](mailto:shantigiriorama@xxxxxxxxxx)>
  - *Date:* Thu, 3 Aug 2006 23:46:48 +0300
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Matti Narkia wrote:

: On Thu, 3 Aug 2006 22:34:23 +0300, "Juhana Harju"

: <[shantigiriorama@xxxxxxxxxx](mailto:shantigiriorama@xxxxxxxxxx)> wrote:

:

:: Matti Narkia wrote:

::: On 3 Aug 2006 09:52:02 -0700, "Ron Peterson" <[ron@xxxxxxxxxxxxxxxxxx](mailto:ron@xxxxxxxxxxxxxxxxxx)>

::: 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).

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:  
: I doubt that

According to this Pritikin site CRP plunged 45 % in average.

[http://www.pritikinca.com/benefits/womensHealth/womensHealth\\_HeartDisease.shtml](http://www.pritikinca.com/benefits/womensHealth/womensHealth_HeartDisease.shtml)

Corresponding Medline abstract:

Metabolism. 2004 Mar;53(3):377-81.

Effect of diet and exercise intervention on inflammatory and adhesion molecules in postmenopausal women on hormone replacement therapy and at risk for coronary artery disease.

Wegge JK, Roberts CK, Ngo TH, Barnard RJ.

Department of Physiological Science, University of California, Los Angeles, CA 90095, USA.

Inflammation and the recruitment of monocytes into the artery wall are thought to be important aspects in the initiation and progression of atherosclerosis. The present study was designed to examine the effects of a rigorous diet and exercise intervention on plasma lipids and inflammatory and circulating adhesion molecules. Twenty postmenopausal women at risk for coronary artery disease (CAD) were placed on a high-fiber, low-fat diet, where food was provided ad libitum and daily aerobic exercise, primarily walking, was performed. In each subject, pre- and post-intervention fasting blood was drawn for serum lipid, insulin, glucose, C-reactive protein (CRP), serum amyloid A (SAA), interleukin-6 (IL-6) and both soluble (s) intracellular and vascular adhesion molecule (sICAM-1 and sVCAM-1) were measured. After 2 weeks, significant reductions in body mass index (BMI) ( $P < .001$ ), glucose ( $P < .05$ ), insulin ( $P < .01$ ), all serum lipids, and total cholesterol (total-C):high-density lipoprotein-cholesterol (HDL-C) ( $P < .01$ ). Reductions in homeostasis model assessment for insulin resistance (HOMA-IR) ( $P < .01$ ), CRP ( $P < .01$ ), SAA ( $P < .01$ ) and sICAM-1 ( $P < .05$ ) were noted, as well as an increase in the quantitative insulin sensitivity check index ( $P < .05$ ). Reductions were also noted in 5 women not using hormone replacement therapy (HRT). No significant reductions were found in IL-6 or sVCAM-1 in response to the intervention. Overall, this intervention resulted in improved metabolic and lipid profiles, reduced inflammatory, and cell adhesion molecules in postmenopausal women in the absence of caloric restriction. The rapid improvements may reduce the risk of acute myocardial infarction (MI), and if sustained, these changes may mitigate the risk for atherosclerosis progression and its clinical consequences. PMID: 15015151

: (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]

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: <<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-alpha, 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-{alpha}, IL-2, and sVCAM-1 and the IL-1beta 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-{alpha}, 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-gamma 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-{gamma} was unchanged and PGE2 and lipid peroxides  
: decreased on the 40%F diet compared to 30%F and 15%F. Post-  
: 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-{gamma}, however, PGE2 and lipid  
: peroxides decreased with increasing fat at baseline at 40%F

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: 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- $\{\gamma\}$ , and lipid peroxide levels."

:

: Here's another interesting study about exercise and inflammation:

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: 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- $\{\alpha\}$ . 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."

—

Juhana

"All facts are theory-laden"

– Paul Feyerabend

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