

Medicine, Science and Health: Seasonal variations in cholesterol levels

If you are concerned about your cholesterol levels, then having just the one test will not necessarily provide you with a true picture of your cholesterol levels. This is because recent research has shown that cholesterol levels are at their highest in the winter months and lowest in the summer. The one off test, therefore, simply provides you with a snap shot of what is happening at that particular time. Instead, you should have your levels checked over the course of a year in order to obtain a much truer picture.

According to a study carried out by Ira S. Ockene, M.D. and his team of colleagues from the University of Massachusetts Medical Center, Worcester, USA, a number of studies have shown this seasonal variation in blood lipid levels to exist, although the exact "mechanism for this phenomenon is not clear". Ockene and his team carried out a longitudinal study of the seasonal variation in lipid levels in 517 healthy volunteers from a health maintenance organization serving central Massachusetts. Data were collected quarterly over a twelve-month period for each volunteer. As well as measuring cholesterol levels, the data included information on diet, physical activity, exposure to light, and general behaviour.

The results showed that the average total cholesterol level was 222 mg/dL (5.75 mmol/L) in men and 213 mg/dL (5.52 mmol/L) in women. Cholesterol levels were increased by 3.9 mg/dL in men, with a peak in December, and by 5.4 mg/dL in women, with a peak in January. Although the seasonal variations in average levels for men and women were relatively modest, changes in cholesterol levels for those participants who already had high cholesterol levels to begin with were much more marked – variations of almost up to 11 points for men and 18 points for women.

Overall, 22% more participants had total cholesterol levels of 240 mg/dL or greater (high cholesterol) in the winter than in the summer. A normal or desirable cholesterol level is defined as less than 200 mg of cholesterol per deciliter of blood (mg/dL). Blood cholesterol is considered to be borderline when it is in the range of 200 to 239 mg/dL. An elevated cholesterol level is 240 mg/dL or above. Therefore, 22% more people would have been diagnosed as having hypercholesterolemia if cholesterol level tests had only been performed during the winter.

The researchers noted that seasonal changes in plasma volume explained a substantial proportion of the observed increase in cholesterol levels in the winter. Blood volume naturally increases during the warmer months. As Ockene

noted "changes in temperature and/or physical activity in winter and summer seem to be related to concomitant changes in relative plasma volume." Because cholesterol measurements reflect how much cholesterol there is in the bloodstream, greater blood volume during the summer months will result in relative decreases in cholesterol levels, and then as blood volume declines during the winter, so cholesterol levels will increase.

Weight can also have a bearing on cholesterol levels. Although people often gain weight during the winter months, Ockene and his team did not find any statistically significant seasonal changes in dietary and caloric intake.

The knowledge that seasonal variations do occur may also be useful to those who are trying to reduce their cholesterol levels through diet and lifestyle changes, rather than taking medication. Given that it takes weeks before changes in cholesterol levels occur as a result of changes in diet, if you were to start a new diet in the summertime you could easily become disillusioned if your next cholesterol check, which occurred during the winter months, showed no change or even an increase.

Whilst the authors of this particular study concluded that more research is needed, in particular as to why seasonal variations are greater in women than men, the evidence must point to the fact that it is wise to carry out more than one cholesterol test, before prescribing a course of treatment for hypercholesterolemia. As Ockene noted "it's important for physicians to know this because they need to factor it into how they treat patients."

References:-

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