

## C O M M E N T A R Y

# The progressive reduction of cholesterol: does it open a way to psychopathology?

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**Summary.** The purpose of this commentary is to highlight the valuable role of Cholesterol in the biochemical dynamics of life. Some curious characteristics of the relationship between Cholesterol and Linoleic Acid are highlighted, not only, as widely documented in humans, but also in different animals such as, for example, bees. In summary, the excessive reduction of Cholesterol could have a disastrous impact on the predisposition to psychopathology, even in its most serious manifestations such as suicide.

**Key Words:** cholesterol, biochemical dynamics of life

## Cholesterol Facts

*According to Popper “Thus science starts from problems and not from observations” (1).*

The discovery that it was possible to reduce cholesterol as a prevention of ischemic heart disease and atherosclerosis, as well as the constant indications, to the point of becoming guidelines, to reduce cholesterolemia more and more to avoid the biochemical “plague” of the 20th century, has produced the creation of synthetic molecules that block the biochemical pathway that leads to the formation of cholesterol and which are among the best-selling drugs in the world.

This evidence, however, can be considered correct for people who have very high levels of cholesterolemia, but certainly not for those who are obliged by institutional health rules, to take drugs to reduce cholesterol even when it is lower than what could present a real risk.

Unfortunately, a powerful literature (2) has forcibly demonstrated the correctness of the assumption, “as little as possible of cholesterol in the blood, as little as possible the incidence of cardiovascular disease”.

*“Statins reduced vascular events regardless of age, even in people over the age of 75”.*

Faced with this affirmation, signed by dozens of authors from all over the world, it is certainly hard to

put yourself in contrast. In 2016, however, and despite not belonging to powerful international lobbies, the British Medical Journal published a letter (3) in which it was concluded that:

*... “Framingham’s cholesterol and other risk factors are not such sensational risk factors but that, perhaps, it is also dangerous to reduce, for example, cholesterol beyond certain limits. Its forced and excessive removal could compromise the structure of cell membranes in the regulatory expression of their functions. We agree with Ravnskov et al. (4) affirming that it is necessary to re-evaluate the guidelines of the risk factors of ischemic heart disease and cholesterol-lowering therapy “... and with Kristensen et al. (5) that “Statin treatment results in a surprisingly small average increase in overall survival within the time to perform the studies. For patients whose life expectancy is short or who have adverse effects of treatment, discontinuation of statin therapy should be considered”.* In the 1980s, 1990s and 2000s, works appeared linking drastic reductions in cholesterol to reduced platelet content of serotonin (psychopathology) and suicidal risk (6, 7). A few years later, researches will confirm not only this occurrence but will also explain, confirming the phenomenon, as Linoleic Acid, in its very low concentrations at the platelet level, detected in suicide attempts in psychiatric subjects, goes hand in hand with the Cholesterol trend. As Linoleic Acid decreases, Cholesterol

also reduces, to allow homeostasis of the platelet membrane mobility, in its affinity with the neuron (8, 9).

A curious observation further confirms how Linoleic Acid and Cholesterol have an extraordinary role in the life and duration of life, for example of bees.

In a recent work (10) some authors formulate a hypothesis regarding the importance of how Linoleic Acid, precisely as it is almost absent in the Queen Bee, present in abundance in the worker bee, can be considered to influence the longevity of the Queen Bee. On the other hand, it has been shown that cholesterol is present since the bee lays eggs but that in the Queen Bee it is far superior to that of the worker bee (11), so the unequivocal mechanism studied in the mammalian organism does not work similarly in other organisms, *id est*, Cholesterol and Linoleic Acid go together.

The enigma is easily explained. In simple words, the increased presence of Cholesterol reduces the entry of oxygen into the cell and therefore reduces its oxidative potential, Cholesterol also has an anti-oxidant function, but, why no Linoleic? The answer is just as simple, because since Linoleic is highly oxidizable, nature has thought well that, instead of making it cooperate with Cholesterol, it was good that there were none, it would have been a waste of the regulatory and defense biochemical mechanisms.

Here, therefore, that Cholesterol and Linoleic Acid, two elements that give life and travel on the same track, find a “small animal” where it is no longer Linoleic that gives life but it is its absence and cholesterol, instead of decreasing to please the Linoleic, reducing would take the life, increases its concentration to lengthen it.

At this point the story comes to an end recalling that unfortunately, and as is confirmed by the experimental data, in humans, when Cholesterol and Linoleic are very low, critical molecular conditions, characteristic of ischemic heart disease and psychopathology can occur, and that, in the presence and under the influence of external factors, they can also lead to suicide (12, 13).

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