

Critical Considerations on Statin Therapy

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ABSTRACT

The clinical experience, backed up by chemical analyzes, such as case observations and statistics, shows that Statin therapy entails significant damage. The focus will be on the importance of cholesterol for the functionality of the brain. The fact that brain cells show a sensitive balance of cholesterol metabolism and have to regulate their needs independently, since the blood-brain barrier does not allow the circulating blood to permeate, has to re-examine the importance and consequences of Statin therapy.

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Introduction

The prophylaxis of arteriosclerosis by means of Statins is given according to current ideas as the standard of therapy. Side effects have been largely hidden as insignificant. In recent years, however, evidence-based statistics have been subjected to harsh criticism, so that the causality of cholesterol as a trigger of arteriosclerosis must be questioned. The decades of experience of this therapeutic approach now reveals signs of a long-term side effect with regard to the negative impact on memory functions and associated with dementia.

Discussion

With the statistics around the Framingham study, started in 1948, and the working groups around Ancel Keys, the approaches to Statin therapy developed. The given objective was directed towards the prophylaxis and therapy of cardiovascular diseases. It basically has to state that the Framingham study only found risk associations and no benefit of a therapy. The later statistics were and will remain controversial. The analysis approaches were based on the lipid hypothesis from the outset and show the strengths of marketing. There are doubts about the connection between cholesterol and atherosclerosis [1]. On the other hand, an ischemic disorder of the arterial vessels due to permanent stress, high blood pressure, nicotine abuse and malnutrition resulting in obesity and diabetes mellitus is more plausible. These risk factors are well in line with the conclusions. The permanent negative stress caused by rhythmic compressions of the arterial vessel wall and stress-specific vascular narrowing of the microcirculation of the adventitia nourishing the vascular wall must inevitably lead to nutritional disorders that lead to selective disorders of the wall properties and the destruction of the healthy structure of the arterial vessels. In order to prevent these processes, Statin therapy is not suitable.

If you look at the group of cardiovascular diseases, you cannot avoid naming the risk factors, which, as already mentioned, can be seen in obesity, sedentary lifestyle, arterial hypertension, stress

and poorly controlled diabetes mellitus. This means a complex system of behavioral disorders, in which obesity makes up the central disorder. It is linguistically and logically to establish the connection to the lipid metabolism, so that the fight against cardiovascular diseases is to be referred to as a textbook standard on the diet. Pharmacotherapy only appears to be indicated if dietary measures fail, for example in the case of genetic disorders of lipid metabolism.

Contrary to this statement, however, the pharmacologically oriented therapy is increasingly coming to the fore, especially in the form of statin therapy. The lipid metabolism is very complex and therefore has to be differentiated accordingly in the various fractions. The focus of the discussion on risk factors for cardiovascular diseases is cholesterol, a polycyclic alcohol from a biochemical point of view. The structure shows how carbon atoms can form covalent bonds with up to four other carbon atoms. As a result, the carbon atoms are strung together in such a way that scaffolds for a large number of organic molecules are created. This is the basis for membrane formation and stabilization. In this sense, as a steroid, it becomes a lipid component. As a building block of cellular structures, hormones, enzymes and other cellular structures, it is synthesized in the liver and controlled by a protein complex with regard to its synthesis and degradation. This is why about 90% of the body's own cholesterol is produced by the body itself. That means nothing else than that it is an evolutionarily developed substance in the human and animal body. The cholesterol metabolism is fundamental.

An alimentary disorder of the lipid metabolism is the causative factor and cannot be assigned to a disorder of the cholesterol metabolism alone. Resorbative changes in the intestine, one-sided forms of deposition such as fat from over-calorie nutrition, play a role. The fat metabolism offers fractions, including the HDL and LDL fractions, by means of which one can make a statement about the dynamics of the cholesterol metabolism, and can also influence these with pharmacological substances. But is this approach sensible and correct?

Atherosclerotic plaques mean tissue destruction and contain decay products of the cell, decay products of the regional metabolism and particles of the body's own defense mechanism, as in any form of inflammatory tissue destruction. This includes cholesterol. But one cannot deduce from this that cholesterol acts as a toxic substrate. This consideration makes a pharmacological therapy against cholesterol and its regulatory system questionable.

It was believed that statistics had proven the benefits of statin therapy. The neutral analyzes of these statistics over the last few years have raised considerable doubts. Inadmissible processing and marketing strategies are listed and thus also reassess the earliest counter- statistics because they could not prove the advantage of the pharmacological idea. The large number of studies makes it problematic to use individual studies on the effect of cardiovascular protection [2]. Even in meta-studies it remains open whether the cholesterol is the cause or just an indication of the study regarding the health of the probands.

Seen in this light, the side effects of these therapeutic agents come to the fore. Symptoms such as joint problems, muscular symptoms such as myalgia and muscular weakness, rhabdomyolysis, kidney dysfunction due to myoglobinuria, liver damage, thromboembolism, wound healing disorders and others, which are considered rare, come into focus with a different value. There is more and more evidence of long-term damage to the nervous system. In terms of this consideration, the biochemical interactions of the influence of cholesterol on nerve cells and their functionalities, which have not yet been fully elucidated, must not be disregarded [3]. Nevertheless, there is a well-founded statement that promoting the development of Alzheimer's disease or dementia as well as psychological and cognitive performance by lowering the LDL cholesterol level can lead to nerve damage overall. It is for example, when statin preparations are taken in the first trimester of pregnancy, disorders in the form of a reduction in the children's IQ ratio, a decline in memory performance and attention, and other cognitive functions [4-7]. As an explanation it is considered that the formation of synapses in the brain is inhibited and thus learning processes and memory performance are disrupted.

What is the significance of cholesterol for the brain? [8]. First of all, it should be noted that cholesterol is an essential building block for brain cells, especially from the myelin generated from cell membranes. It is the basis of hormonally active neurosteroids and signaling molecules. However, since the blood-brain barrier prevents the absorption of cholesterol from the circulating blood, the necessary cholesterol must be synthesized by the brain cells themselves. This affects the synthesis as well as the breakdown. The steroid hormones regulate various brain functions: Development of the nervous system with the formation of dendrites, of connections of the synapses, myelination and psychological processes such as recognition, emotions and the control of behavior. Neurons and glial cells have important enzymes for steroid hormone synthesis. As a result, different brain regions are able to independently convert cholesterol into a wide range of hormonally active steroids. These neurosteroids are thus produced locally in the producing cell and are locally effective. As has since been determined, neural stem cells are also formed in old age through various stimuli. The brain therefore needs cholesterol throughout life. It should be noted that the synthesis rate in the brain is low but the retention time is long. Since various statins can pass through the blood-brain barriers, they disrupt the sensitive equilibrium of the cholesterol metabolism in the glial cells and lead to a decrease with serious functional consequences. It is therefore an important aspect to

clarify what influence individual statins have on the homeostasis of cholesterol and thus on the functionality of the brain.

There is a consensus that arteriosclerosis is the result of a chronic inflammatory process. With the biochemical clarification of the processes of lipid metabolism it was concluded that two key enzymes, the LDL and HDL proteins, are causally related to it. It was ignored that the physiologically regulating protein complex of the liver, as mentioned above, is not only controls the needs of the body or individual tissues, but regulates the whole body dynamics. This relativizes the molecular importance as the basis of a therapy strategy.

Conclusion

The subject-related and specialized therapy strategies have the disadvantage that findings and knowledge from other related disciplines are not sufficiently considered and appreciated. This can be detrimental to the patient. This danger can be seen in the example of statin therapy. Long-term experience in dealing with statins indicates neurological- psychiatric disorders that this statement underlines the disadvantage and in a certain way calls into question the exclusivity of specialization. It seems advisable to return in line with Alexander von Humboldt's philosophy and view of knowledge and to seek more intensive cooperation. In the present case, it is advisable to reconsider statin therapy.

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