Can dairy products lower high blood pressure?

More and more research evidence is showing that three servings of milk and/or dairy products a day, as part of a balanced diet, can play a role in preventing both pre-hypertension and stage I hypertension.[1-6] Dairy products contain a unique mixture of nutrients and bioactive components, which can act together or independently to promote health.

Milk and dairy products such as maas, yoghurt, cottage cheese and other cheeses, are integrated food systems that contain specific proteins, fats and carbohydrates that have beneficial physiological properties and also provide essential vitamins and minerals.[2,7,8]

The facts

- Various studies have confirmed that calcium intake from milk, dairy products, and supplements can lower blood pressure. Interestingly, researchers have found that the blood pressure lowering effect is more consistent when dairy products, rather than calcium supplements, are used.[2,3,9]
- It would appear that the beneficial effect of dairy intake on blood pressure is not just caused by calcium, but by the complete nutritional profile of dairy products. The minerals, vitamins, proteins and essential fatty acids found in dairy products, all contribute to this effect. In addition the specific peptide sequences (the way in which protein sub-units are arranged) in dairy products are also believed to play a role in lowering blood pressure.[2,7]
- Low-fat dairy products appear to be even more efficient when it comes to lowering blood pressure, than those dairy products with higher fat contents.[4,5,6]

The evidence

- A clinical trial called the DASH (Dietary Approaches to Stop Hypertension) Study, in which 459 adults participated for 11 weeks, found more dramatic decreases in blood pressure when the subjects ate diets rich in dairy, fruit and vegetables than when the diets were rich in fruit and vegetables, but not in dairy (Diastolic blood pressure(DBP) reduction: –5.5 mmHg on the diet rich in dairy, fruit and vegetables, versus –2.8 mmHg on the diet without a high dairy content; systolic blood pressure (SBP) reduction: –11.4 mmHg (dairy, fruit and vegetables) versus –1.1 mmHg (fruit and vegetables)).[1]
- The DASH trial also showed that the dietary effect on lowering blood pressure is even more significant when low-fat dairy products are included. The best blood pressure results were found in patients with hypertension.[1,4]
- In South Africa a cross-sectional study, which involved 325 adult subjects from various cultural groups, showed that the more dietary calcium the subjects consumed the lower their systolic and diastolic blood pressure readings were.[10]
- A systematic review and meta-analysis of nearly 45 000 individuals showed that blood pressure was reduced by 13% when dairy was consumed).[5]

Bioactive peptides in dairy

Angiotensin-I-converting enzyme (ACE) plays a vital role in the rennin–angiotensin system, which is one of the most important regulators of blood pressure and also helps to balance fluid and electrolytes in the body. ACE converts inactive angiotensin I to angiotensin II, which increases blood pressure by causing the smooth muscles of the veins to contract.[2,12] So if ACE can be inhibited, blood pressure will be reduced; this is the fact on which the ACE inhibitor medications, which are used to treat high blood pressure, are based.

Proteins are well know as sources of essential amino acids (the building blocks of proteins), but recent research indicates that many food proteins contain so-called 'encrypted peptide sequences' which have specific physiological functions. Studies have shown that the milk proteins (casein and whey) are rich sources of bioactive peptides that are able to inhibit the activity of ACE.[13] The ACE- inhibitory peptides in dairy foods are released by the action of enzymes during digestion, fermentation or processing.[1,7,12] During the fermentation of milk and maturation of cheese, the milk proteins are broken down to a number of these ACE- inhibiting peptides by the action of enzymes (proteases) found in milk, or coagulants and microbial enzymes that are added to milk. For example lactic acid bacteria are added to milk during the production of yoghurt.

It has been demonstrated that the specific bioactive dairy tripeptides found in fermented milk, such as maas, can reduce blood pressure by about 6–9 mmHg SBP and 3–7 mmHg DBP.[14,15] This is significant because hypertension is a serious problem in South Africa and being able to use popular foods such as maas and yoghurt to either prevent or combat high blood pressure, would be a boon to our population.

Conclusion

It is, therefore, evident that dairy products can help to lower high blood pressure. In contrast to the high cost of hypertensive drug therapy, which could have negative side effects, three servings of dairy products per day can be recommended as part of a healthy diet to prevent high blood pressure, one of the major causes of illness and disability in South Africa.[1]

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