Letters to the Editor
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Milk casein and its benefits on cardiovascular risk

The article by Lorenz et al. on the effects of adding milk on the protective effects of tea is interesting, but results may not translate into clinical benefits. This was a small sample that lacked statistical power and failed to take into account the dietary habits of the participants. Even when milk was not added to tea, participants may have consumed diary products, which may alter consistency in the control group. In a general population, consumption of diary products is prevalent even when not added to tea, and it would be interesting to observe the effect of milk-free tea in a population that is totally devoid of diary products, but which is not practical. The work of Lorenz et al. assumes importance, as milk has been associated with hypercholesterolaemia, diabetes, and increased cardiovascular risk. On the contrary, the benefits of milk in reducing blood pressure and cardiovascular risk have also been proved through previous studies. A Medline search limited to the past 5 years using keywords milk and blood pressure shows that milk consumption is clinically beneficial and reduces blood pressure. A recent study by Cadee et al. and a previous study by Townsend et al. have demonstrated that Bovine casein hydrolysate (c12 Peptide) was able to reduce blood pressure. In this context, the results from Lorenz et al. must be viewed with caution. The effect of milk on endothelium appears independent and not as an interaction with tea. Whether increasing the ratio of tea extract to milk will overcome this phenomenon needs to be explored. Many such dietary substances and antioxidants while showing significant benefit on surrogate markers have failed to show any mortality benefit. Nevertheless, this study will hopefully trigger larger mortality studies, but the objective will not be clinically relevant or socially practicable in countries with high consumption of milk.

References

As described under ‘Study design’ in our article, subjects with, for example, diabetes, obesity, and certain food patterns such as vegetarian lifestyle as well as high regular tea consumption were excluded from the study. All participants involved in the study fasted overnight, thus avoiding the confounding effects of other diary products. At the day of FMD measurement, all subjects received a standardized breakfast consisting of one croissant, thus limiting the influence of a surrounding food matrix on the FMD response. This information had all been outlined under ‘Study design’. The authors comment on the beneficial effects of milk, including casein, on blood pressure and cardiovascular risk. The aim of our study was to investigate the interaction of milk with tea and to determine whether addition of milk (as practised in many countries) could have an adverse impact on the beneficial effects of tea alone on endothelial function. We do not question the beneficial effects of milk on its own. Also, our objective was not to investigate the effects of milk alone on the endothelium. However, recent publications have demonstrated the benefits of tea alone on mortality. A large prospective cohort study has shown that drinking green tea is associated with reduced cardiovascular disease and all-cause mortality.

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Milk casein and its benefits on cardiovascular risk: reply

We appreciate the interest of Prabhakar and Venkatesan in our study ‘Addition of milk prevents vascular protective effects of tea’. The authors raise the question that the small sample size could lack statistical power and point out the failure to take the dietary habits of the participants into account. They further note that participants may have consumed other diary products, thus affecting also the control group.

We do not agree with the authors that the sample size in our study was too small. A total of 16 subjects (as in our study) is adequate for studies measuring endothelial function. In addition, our FMD results after consumption of the different beverages were highly significant. Addition of milk to tea not only reduced, but completely blunted the effects of tea on its own (P < 0.01; tea with milk compared with tea alone). Comparable studies measuring FMD in humans after consumption of beverages comprised a sample size similar to our study and also yielded statistical significant results: e.g. after consumption of red and white wine,1,2 black tea,3 and cocoa.4

References

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In their article, Lorenz et al. report results of experiments in 16 healthy post-menopausal women and of additional in vitro experiments in rat tissue.1 They infer that milk may counteract the known favourable effects of tea on vascular function. Further, they speculate that this finding may explain the lack of effect of tea on cardiovascular outcomes found in a previous population-based cohort study conducted in Caerphilly/Wales.2 In this study, almost all participants added milk to their tea, and consequently, there was no control group of 'purist' tea drinkers.

The European Society of Cardiology accompanied the publication of this study with a press release that amplified the authors’ conclusions.3 As milk is in many tea-cups worldwide, it is not surprising that the ‘bad news for tea-drinking nations such as the British’ has spread rapidly and widely. Most related headlines left no room for doubt, e.g. ‘Milk cancels health benefit of drinking tea: study’4 or ‘Tea is good for you, but skip the milk’.5 Only few agencies took the time to produce a more balanced news piece by including additional information from an independent expert6 or additional literature.7 A simple explanation and some good advice sell better than the complexities of the real world. Also, it is well known that bad news is more likely to be published in newspapers than good news.8

Although the authors call for caution in the design of studies, they were less cautious when drawing inference from their data. The latter are derived from measurements in a few selected volunteers who drank tea in a laboratory and were not representative for any part of the population. Beyond the contentious question whether flavonoids in black tea are absorbed by milk proteins or not,9,10 evidence from relevant population-based studies is not yet in sight. Instead of measuring vasorelaxation, such studies would certainly choose outcomes that are more meaningful to populations, for instance, incidence of ischaemic heart disease.2 The present study could well serve as a starting point for the planning of such studies, but cannot replace them. It is hazardous to derive lifestyle advice from a single lab study. Such advice is likely to have a short shelf life when additional evidence is taken into account or new research data accumulate.

As doctors, we would not prescribe a new drug to patients if it was studied only in one small study. In analogy, milk abstinence should not be recommended to tea drinkers on the basis of evidence of similar strength. If science journalists carry news from the bench to excess, scientists should object. Publicity may help them along for a while, but they risk to be no longer heard by the public in the long term. Clearly, this story has not helped the case of public health. As long as the reported results are not confirmed in a fair number of humans who drink their tea outside the lab setting, we will continue to add milk to ours.

References