



Calcium Supplementation and Cardiovascular Risk

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Foetal programme is the phenomenon whereby alteration in foetal growth and development in response to the prenatal environment have long term or permanent effects. Numerous studies (1-5) demonstrate that fracture risk might be programmed during intrauterine life as it has been seen that there is a direct relationship between birth weight, weight in infancy and adult bone mass. Thus, the optimization of maternal nutrition and intrauterine growth should also be included within preventive strategies against osteoporotic fracture. 2nd period of preventive intervention should start in adolescence, as bone mineral acquisition starts in adolescence. Positive benefit of adequate or supplemented calcium intakes on bone mineral content (BMC) in females during the 2nd and 3rd decades are reflected in later life (5). 3rd Period of preventive intervention should ideally begin long before the menopause. Whenever, women consult for the 1st time for peri-or postmenopausal complaints or for any other disease, as a golden rule (any female coming to any physician in her 40's) should be started preventive prophylaxis in form of calcium and Vitamin D along with exercise and life style management (4).

Calcium and Vitamin D are considered to be pharmacologically active, safe and cost effective for prevention and treatment of osteoporosis, hence can be administered safely to most men/women indefinitely starting as early as possible. They exerts a synergistic effect with antiresorptive agents on BMD, bone strength and in terms of fracture prevention. It is appropriate to add 1000-1500 mg/day calcium and 400-800 IU vitamin D to most therapies under current guidelines (6-9). Currently for Indian population calcium

supplementation is recommended in all regardless of BMD (10). In one of the Indian study it was documented that the extra urinary calcium loss during the postmenopausal period is 30 mg per day. As calcium absorption in this age group is lower than young adulthood, the amount of extra dietary intake needed to offset this loss is as high as 260 mg. This would increase the recommended intake from 1000 mg for younger adults to 1300 mg per day in their menopausal period (11).

However, the recent finding of the Auckland Calcium Study (12) which showed, that myocardial infarctions and other cardiovascular events and related mortality were more common in women randomized to calcium, and thus has raised so many question regarding the preventive/prophylactic role of calcium in females right from their adulthood to old age, which has been since long regarded as a fundamental part of the prevention and treatment of postmenopausal bone loss. Myocardial infarction was more commonly reported in the calcium group than in the placebo group (45 events in 31 women v 19 events in 14 women, $P=0.01$). The composite end point of myocardial infarction, stroke, or sudden death was also more common in the calcium group (101 events in 69 women v 54 events in 42 women, $P=0.008$).

A subsequent randomised, placebo controlled trial (13) to determine the effect of calcium supplementation on myocardial infarction, stroke and sudden death in healthy postmenopausal women established that Calcium supplementation in healthy postmenopausal women is associated with upward trends in cardiovascular event rates. The study suggested that potentially detrimental cardiovascular effect should be balanced against the likely

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benefits of calcium on bone. In another recent study, substantial increases in vascular event rates, particularly myocardial infarction, in women randomized to calcium was found. These effects were more marked in those who were highly compliant with their calcium supplements. Calcium supplementation also appears to accelerate vascular disease in patients with renal impairment, including those not yet requiring dialysis (14).

Similarly, an independent association between higher baseline serum calcium levels and higher rate of cardiovascular events was established in another recent study (15). Also, there is substantial epidemiological evidence that serum calcium levels in the upper part of the normal range are a risk factor for vascular disease (16). Given the potential for harm with calcium supplementation in healthy postmenopausal women and adverse intermediate outcomes in patients with end stage renal disease, calcium as a supplement should be prescribed with caution even in healthy subjects (17).

Meta-analyses of these data and more studies will be necessary to settle this matter in future. Women at all stages of life be it pregnancy, lactation, perimenopause, postmenopause need adequate supplementation of calcium along with Vit D as a preventive prophylaxis. However, in view of recent cardiac and renal concerns documented by few studies, emerging in relation to calcium prophylaxis for prevention of postmenopausal osteoporosis, it may become necessary to focus on initial evaluation and intermittent monitoring for cardiac & renal risk factors and diseases before starting calcium and Vit D prophylaxis. At the same time while updating guidelines regarding preventive and therapeutic strategies for postmenopausal osteoporosis, this concern need to be addressed.

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