

# UT News

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\*\*\*\*UTHSCD researchers urge caution in use  
of calcium as hypertension therapy

DALLAS--The jury is still out in the case of calcium versus high blood pressure.

A recent study conducted at The University of Texas Health Science Center at Dallas and reported at the Southern Society for Clinical Investigation in New Orleans on Feb. 6 showed that a majority of hypertensive patients treated with calcium supplements showed a small drop in blood pressure. However, the results were far from conclusive, with about one-fifth of the patients showing drops of 20 to 30 points and another fifth showing equally dramatic increases in blood pressure.

The Dallas researchers urge a cautious approach to calcium therapy. "Our word is 'Don't jump on the calcium bandwagon.' Wait until more research is done on larger populations," says Dr. Norman Kaplan, head of the UTHSCD hypertension unit and one of the investigators. "At present there is nothing about the patient we can identify that will tell us if that person will have a good or a bad response to calcium."

The Dallas study was conducted by three research fellows and was presented by Dr. Rod Meese, now on the staff of the Duke University Medical Center. It involved 26 patients in a randomized, double-blind, cross-over design. Each patient received two of three possible therapies for eight weeks each with a "washout" period of two weeks between therapies. The treatment choices included 800 mg. daily of calcium citrate or calcium carbonate or a placebo. Therefore, two-thirds of the group received one of the two calcium supplements and a placebo during the trials. The other third received two calcium supplements.

The 26 patients who completed the tests were mildly to moderately hypertensive, with mean standing blood pressures of 146 mm Hg over 102 mm Hg and mean supine blood pressures of 143 mm Hg over 96 mm Hg. Blood pressure is measured in millimeters of mercury (Hg), each millimeter referred to as one point. The "upper" figure represents the systolic reading, the pressure of blood flow when the heart beats. The second, lower number is the diastolic reading, representing the flow of blood between heartbeats. A standing blood pressure is taken with a patient in a vertical position; supine, while lying down. The greatest changes were reflected in standing systolic pressures.

Meese reported that, of the 17 patients who received a placebo and one form of calcium the average standing systolic pressure rose on placebo. It fell less than one mm Hg on both forms of calcium. However, the splay in the individual levels included some pressures falling by as much as 30 mm Hg, others rising by that much or more. Other measurements of blood pressure were not significantly affected.

Furthermore, the variations in blood pressure were not statistically correlated with initial levels or changes in serum or urine calcium, serum magnesium, urine sodium, body weight or plasma renin activity. A closer examination of the five patients whose pressures rose the most and those five whose pressures fell the most on calcium supplements showed no significant overall differences between the two groups in any of their initial levels or in the changes that occurred during the trial. There was no basis for predicting their reactions.

"Since it is not possible to identify those who would respond favorably versus those who would respond adversely, we believe calcium supplements should not be given for the treatment of hypertension," Meese concluded. "In fact, our data suggest the need for caution and careful measurement of blood pressure when calcium is given for the treatment or prevention of osteoporosis, since one of the largest

(OVER)



risers in pressure in our series was seen in a thin, older white woman--a prime candidate for calcium therapy of osteoporosis."

Kaplan explained that the theoretical basis of treating high blood pressure with calcium is ambiguous, with some evidence that low blood pressure is associated with a comparatively high calcium intake and other evidence that calcium constricts blood vessels, raising the blood pressure.

On the positive side for calcium therapy Kaplan cited the National Health and Nutrition Examination Survey, which recorded a one-day food diary for 10,000 Americans in the 1970s. This survey showed an inverse relationship: the more calcium ingested in the diet, the less hypertension; the less calcium, the more hypertension.

Another piece of evidence that low calcium levels might be associated with hypertension is that there is less free calcium in the blood and more in the urine of people who have high blood pressure than in people with normal blood pressure.

This is puzzling, says Kaplan, because on the one hand hypertensives appear to ingest less calcium than people with normal blood pressure, yet they excrete more calcium in their urine. This might indicate the hypertensive person is deficient in calcium, which would support calcium therapy. However, more calcium may be excreted because of increased intake and excretion of sodium (table salt) since sodium takes calcium with it into the urine.

The third piece of evidence is that laboratory tests on rats showed that calcium therapy lowered blood pressure. "And now in two studies on humans," Kaplan says, "some change is effected, but not a large change and not a consistent one."

Current medical knowledge, in fact, would seem to argue against calcium therapy. "We know that calcium is involved in the contraction or constriction of blood vessels. If you put more calcium into a blood vessel, it constricts and raises the pressure," says Kaplan. "There is a whole group of drugs called calcium blockers, which is used to treat hypertensives and effectively lower the blood pressure. So the theory that calcium lowers blood pressure doesn't make sense."

Another recent study by Drs. David McCarron and Cynthia Morris at the Oregon Health Sciences University in Portland showed a mean drop of 5.6 mm Hg in the standing systolic pressure of hypertensive patients on calcium supplements of 1000 mg. a day. Their study, reported in the December 1985 *Annals of Internal Medicine*, also recorded a wide divergence with one-sixth of the patients dropping 20 to 40 points and another sixth showing comparable increases.

McCarron and Morris gave a qualified endorsement to calcium therapy. Their abstract concludes, "Treatment with 1000 mg/d of oral calcium for 8 weeks represents a safe, well-tolerated, nonpharmacologic intervention that lowers blood pressure in selected patients with mild to moderate hypertension."

"I feel the important word is *selected*," says Kaplan. "More study may show a way to select those whose blood pressures will be helped by calcium supplements and those who will be harmed. Until then, we urge caution in both the medical and lay-public use of calcium supplements."

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