

# DO ACIDIFICATION AND SAMPLE STORAGE CONDITIONS AFFECT SPOT URINE CALCIUM CONCENTRATION?



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## BACKGROUND

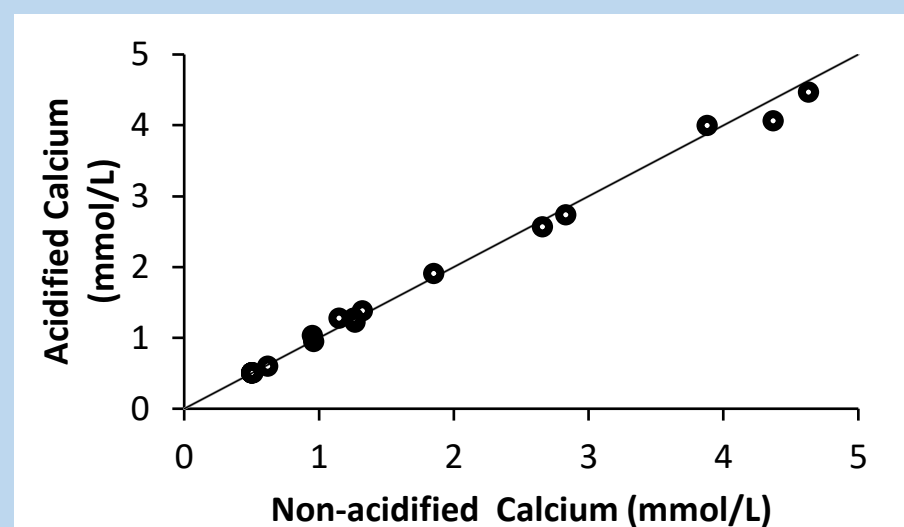
Currently there is little consensus on the optimal pre-analytical conditions for the measurement of urine calcium concentration. It is common practice to acidify spot urine samples prior to analysis to pH level < 2 which is based on the long-held belief that doing so ensures calcium solubility (1,2). To understand this further, we aimed to determine whether there was a difference in spot urine calcium concentrations after acidification compared with non-acidified samples and also whether the calcium concentrations were stable in non-acidified samples at room temperature and after refrigeration at 4°C for 48 hours.

## METHOD

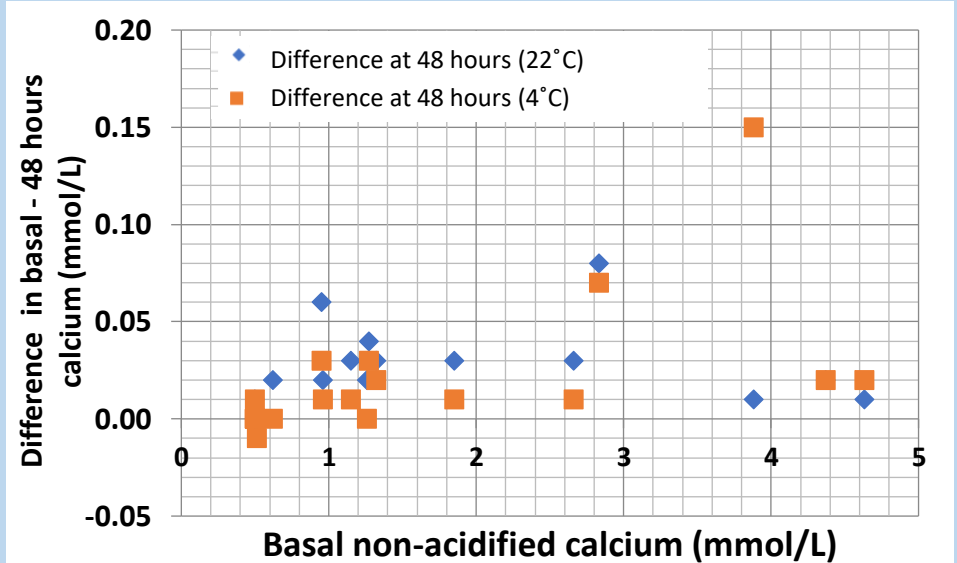
Twenty fresh random urine samples which were kept at -30°C were thawed and basal pH was measured. The samples were aliquoted to yield two sample sets: the first were non-acidified with no adjustment to the basal pH; the second were acidified with 6M HCl to a pH < 2. The urine calcium were measured in both the non-acidified and acidified samples. Aliquots of the first set were further divided into two groups and stored for 48 hours at a) at room temperature and b) in the fridge at 4°C. All of the aliquots were analysed for urine calcium. All analyses was performed on the Architect c16000 chemistry analyser (Abbott Laboratories, Maidenhead, UK) using the manufacturer's methods.

## RESULTS

Comparison of non-acidified and the acidified samples of the spot urine calcium concentrations showed good agreement after removal of one outlier (Fig 1). Additionally, there was no difference between non-acidified basal calcium concentrations and samples stored for 48 hrs either at room temperature or in the fridge at 4°C (Fig 2).



**Fig 1.** Scatter plot of non-acidified and acidified spot urine calcium concentrations



**Fig 2.** Difference plot between non-acidified basal calcium concentrations and samples stored for 48 hrs at room temperature (22°C) and refrigerated (4°C).

## CONCLUSIONS

Acidification of spot urine samples are not necessary prior to calcium analysis. Short term storage, up to 48 hours at room temperature, does not affect results significantly.

## REFERENCES

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