

Effect of the Administration of Isoniazid and a Diet Low in Vitamin B₆ on Urinary Excretion of Oxalic Acid

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THE OBJECT of the present study was to determine whether or not isoniazid, which is known to interfere with the utilization of vitamin B₆, hastens the depletion of the body stores as judged by the excretion of oxalic acid in the urine. Preparatory to later work with a group of subjects, one subject was studied. Although no conclusions can be drawn from results obtained in only one subject, this report may serve to give some helpful indications to those working in the field.

CASE REPORT

The subject was a woman who had been living on a diet relatively high in vitamin B₆ content. She was maintained for fifty-four days on a weighed diet calculated to contain 0.6 mg. of vitamin B₆, 2,100 calories and 53 gm. of protein per day. On the eleventh day she was given isoniazid in the amount of 3 mg. per kg. of body weight; the dosage was gradually increased to 10 mg. per kg. and was stopped on the fifty-second day. The patient experienced mild nausea at first, and a lack of appetite throughout the period of isoniazid treatment.

COMMENTS

The oxalic acid content of two day composites of urine were determined by the method of Powers and Levatin.¹ Beginning about the twenty-fifth day a slight upward trend was noted in the urinary excretion of oxalic acid. The lowest value of 25.3 mg. per day occurred in the composite for days 23 and 24; the highest value of 32.4 mg. per day occurred in the composite for days 45 and 46.

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The variability was so large and the increase so small that the regression of oxalic acid against time was not statistically significant. Isoniazid therapy was discontinued at the end of the fifty-second day, although the diet was continued for two additional days. On the last day (fifty-fourth), a load dose of 20 mg. of pyridoxine hydrochloride was administered before breakfast. The oxalic acid content of the urine was 33.3 mg. for the following twenty-four hours. Apparently the added vitamin B₆ had no effect on the amount of oxalate excreted by the kidney within twenty-four hours.

According to a modification by Donald² of a method for the determination of pyridoxal phosphate by McCormick et al.,³ the pyridoxal phosphate content of the leukocytes in the blood of the subject, determined on six different days while she was consuming her customary diet, averaged 0.24 mμg. per million cells. On the fifty-first and fifty-second day of the depletion diet, the pyridoxal phosphate content of the leukocyte was 0.15 and 0.16 mμg. per million cells.

According to a differential count of white cells, the lymphocytes decreased from 28 per cent (before initiation of the diet) to 20 per cent (forty-sixth day of the diet) and was again 22 per cent (fifty-third day of the diet). Three months after the end of the dietary period, the percentage had returned to 28. Kolmer⁴ states that the percentage in normal adults is 20 to 30; therefore, even though there was a decrease in the percentage of lymphocytes, it was still within the normal range.

CONCLUSION

These findings lead to the conclusion that the vitamin B₆ level in a subject who had been living on a diet relatively high in vitamin B₆ could be slightly depleted over a period of fifty-four days if he were maintained on a diet containing 0.6 mg. of vitamin B₆ per day plus small amounts of isoniazid. Since others^{5,6} have found a mild degree of depletion in a similar period of time in patients who did not receive isoniazid, the question arises whether isoniazid enhances depletion. If isoniazid helps to deplete vitamin B₆ stores, a dose larger than the one used in this study is necessary in order to deplete the stores in a person with good stores within four or even six weeks.

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