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Evaluation of Blood Ammonia Checker According to Daiichis System

Maria Wettstam-Andersson

University Hospital, Department of Clinical Chemistry, Uppsala, Sweden

INTRODUCTION

Presentation of Daiichis system for determination of blood ammonia in capillary whole blood. According to the manufacture, the system has a clinical use in screening for hyperammonemia and stat procedure for liver coma. The system has been tested for linearity and imprecision.

PRINCIPALS

Whole blood, 20 µl is applied to a reagent plate which contains an alkaline buffer (sodium carbonate, sodium bicarbonate). The specimen becomes alkaline and the ammonia is liberated from the blood. The ammonia gas diffuses through a polypropylene film at the bottom of the reagent plate, and penetrates into a color developing section, which is treated with a pH buffer (bromcresolgreen). The degree of color development is proportional to the amount of ammonia released. The blood ammonia concentration will be determined reflectrometrically by inserting the test plate into the "Blood ammonia checker".

RESULTS

A reference value of 71±21,8 µmol/l (mean ± SD) was obtained by analyses of capillary blood from 22 healthy individuals.

The linearity of the method was good in the range 25-270 µmol/l.

Table 1. Imprecision of the method at different concentration levels.

n	conc. level (µmol/l) $\bar{x}$ ± SD	CV %
9	29 ± 11.6	40.0
5	77 ± 6.4	8.3
10*	123 ± 13.1	10.7
5**	268 ± 30.0	11.7
5**	323 ± 11.4	3.5

* The increase in NH_4^+ was achieved by placing a cuff around the biceps muscle inflate it to a pressure exceeding the systolic pressure by 30 mmHg, and performing muscular exercise.

** Whole blood supplemented with ammoniumchloride.

CONCLUSIONS

The "Blood ammonia checker" is a small easy to use system which could be used in bed side testing. There is, however, a rather pronounced difference in venous and capillary blood ammonia concentrations. Due to the high imprecision in the low concentration range the system is not suitable for venous blood specimens.