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Abnormal Pattern on High-voltage Paper Electrophoresis (HVPE) During Paracetamol Medication

Short Communication

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ABSTRACT

An extraneous ninhydrin-positive spot on high-voltage paper electrophoresis (HVPE) was observed in urine samples collected from children receiving paracetamol medication. Interference by this derivative has not previously been reported. This extraneous spot could simulate an abnormal peptiduria.

INTRODUCTION

A number of drugs have been reported to interfere with the chemical tests used in urinary metabolic screening, i.e. acetylsalicylic acid, phenothiazine, nalidixane (Negram®) etc. (2). Ampicillin derivatives may give ninhydrin-positive spots on paper chromatography (4) or HVPE (3). In the present paper an extraneous spot on HVPE due to paracetamol (*N*-Acetyl-*p*-aminophenol/Alvedon®) has been observed in urine samples.

METHODS

High-voltage paper electrophoresis (HVPE) for the separation of amino acids was performed at 2.5 kV for 2.5 hours in a formic acid/acetic acid/water buffer (27 : 87 : 887, by volume), at pH 1.9, according to Holmgren et al. (3). Furthermore a number of reagent strips and chemical tests for the analysis of amino acids, metabolites, mucopolysaccharidosis or carbohydrates according to Hambræus & Holmgren (2) have been used.

RESULTS AND CONCLUSIONS

When urine samples from 14 children receiving paracetamol (Alvedon®) were subjected to HVPE,

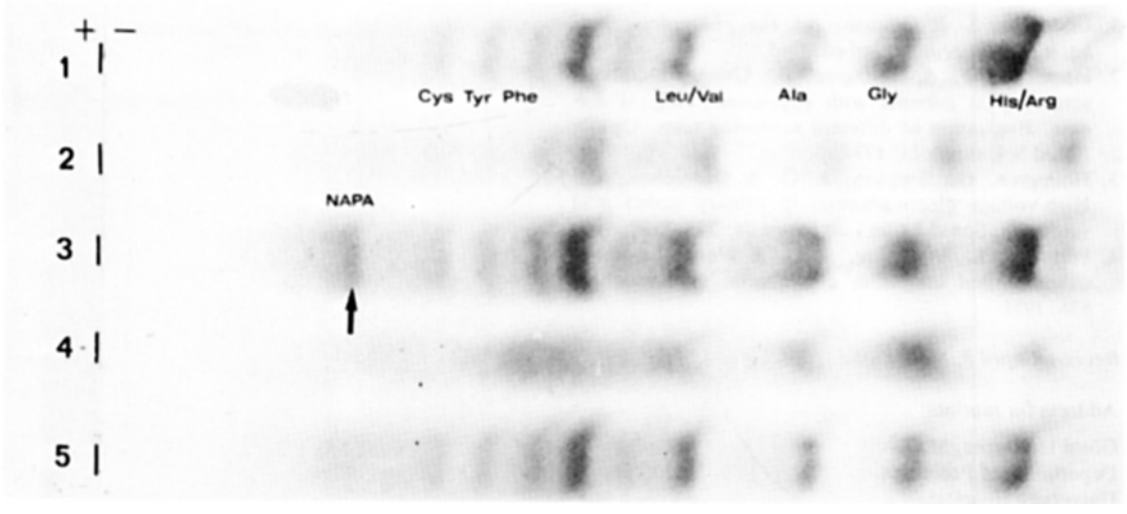

Fig. 1. Urine samples of a patient receiving paracetamol (Alvedon®) medication examined by high-voltage paper electrophoresis at pH 1.9. The samples were collected (1) and (2) before, (3) during, and (4) and (5) after cessation of the medication. The arrow indicates the abnormal spot.

an extraneous ninhydrin-positive spot was observed 7–8 cm from the application zone (glycine at 24 cm) (Fig. 1). This spot was not seen before or after cessation of the medication in these patients. No positive reaction was seen in reagent strip tests or the chemical test used.

Paracetamol (NAPA) is an anilide which is the main pharmacological constituent in an number of drugs with analgetic, antipyretic or anti-rheumatic effects.

The extraneous ninhydrin-positive spot on HVPE may be due to a reaction between ninhydrin and a metabolite of paracetamol, perhaps *p*-amino-phenol, since this substance was found to react positively with ninhydrin. Furthermore, this substance is known to be excreted in the urine during paracetamol medication (1). The problem is under investigation.

Various drugs containing an NH_2-group or their metabolites, may react with ninhydrin to give spots on paper chromatography, HVPE, or thin-layer chromatography, simulating abnormal metabolites or peptides. Misinterpretation of such spots may cause considerable confusion. Thus the possibility of artefacts due to drugs should always be borne in mind when screening urine samples by HVPE, paper chromatography, or thin-layer chromatography. Information about the patient's medication should always be required.

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