Drug Interference in Amino Acid Analysis

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Many drugs, particularly antibiotics, have ninhydrin positive metabolites. These can cause confusion in the interpretation of amino acid chromatography, particularly in urine samples. Accurate identification of drugs, that are not co-chromatographing with diagnostically significant amino acids, is useful because it obviates the need to request repeat samples. Despite requests for prescribed drugs to be identified on laboratory request forms this information is frequently lacking. It is also notoriously difficult to ascertain this information retrospectively.

We therefore decided to catalogue these interferences where possible. We have found it helpful to be able to characterise the interferences by separate two chromatography systems.

We have characterised the interference of a small group of drugs by 2 dimensional TLC on cellulose plates and automated ion exchange chromatography using a Biochrom 30 analyser. One of the confounding factors in cataloguing these interferences is that most patients are prescribed multiple therapies.

The following list describes approx position of metabolite spots or peaks.

Drug	TLC	AAA	Fig.
antibiotics			
amoxicillin	beta ala; ileu/leu/phe	gly-val; tyr	1
ampicillin	ileu/leu/phe	homocys-lys	2
cephradine	ileu/leu/phe	OH lys	3
anticonvulsants			
vigabatrin	beta ala; above BAIBA	alpha amino adipic OH lys	4
analgesic			
paracetamol	ala	phe	5

Methods

Thin Layer Chromatography

Urine samples were seeded onto cellulose acetate sheets relative to the creatinine concentration.

1. development in first solvent: methyl pronanol, ammonia, butanone
2. developments in second solvent: acetone, butanol, acetic acid
3. location reagent, ninhydrin and pyridine

Automated Ion Exchange Chromatography

Biochrom 30 amino acid analyser, Biochrom Ltd, Cambridge, UK

Full technical details available from: ian.sherratt@leedsth.nhs.uk

Fig. 1: Amoxicillin

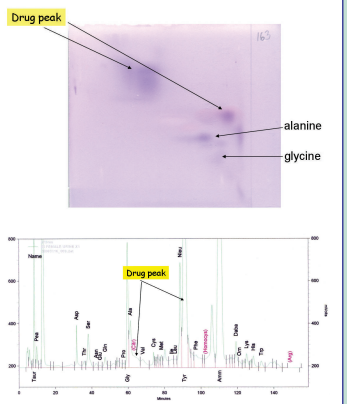


Fig. 2: Ampicillin

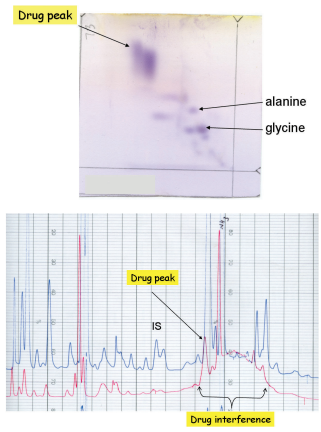


Fig. 3: Cephradine

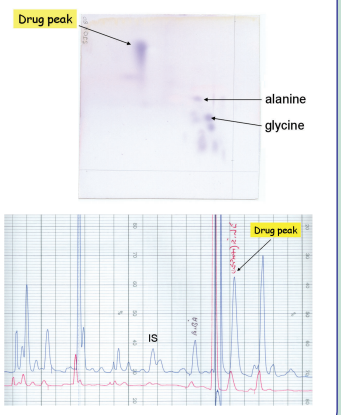


Fig. 4: Vigabatrin

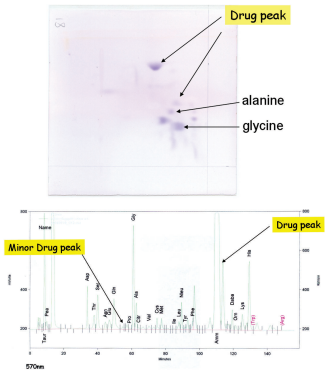
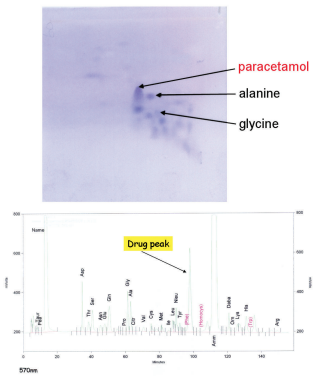


Fig. 5: Paracetamol



Images of the chromatograms have been mounted on the website of the MetBioNet: www.metbio.net

We would like to invite contributions of other examples to this database with the aim of creating an open access resource.

Please contact Mick Henderson if you are able to submit a contribution mick.henderson@leedsth.nhs.uk