ERNDIM Qualitative Blood Spot Acylcarnitine Scheme 2006

Two circulations (7 & 8) were sent out during 2006. Circulation 7 was sent out on 27th June with a return date of 28th July 2005. Circulation 8 was dispatched on 5th January 2007 with a return date of 2nd February 2007. Samples were sent to 70 laboratories for both circulations. 56 returns (80%) were received for circulation 7 (all by the due date) and 54 (77%) for circulation 8 (all by the due date).

Although all returns reached us by the appropriate due dates there were at least 20% of laboratories, on each circulation, who failed to make a return. 12 laboratories failed to make 1 return, but 9 laboratories provided no return for both circulations. In 2007 we intend to introduce a scoring system, equivalent to the qualitative urine organic acid scheme. Obviously, failure to return results will result in a poor score. As a prelude to scoring circulation 9, the returns for 2006 are being scored retrospectively. An explanation of the final scoring criteria and a report of the 2006 scores will be reported to each laboratory in the scheme. The intention is to provide this with the report on circulation 9, or, potentially, by e-mail.

No formal questionnaire on methodology was sent out in 2006. The majority of laboratories are providing results that are consistent with butylation of the samples and full scan acquisitions. There was a slight increase in the proportion of laboratories using underivatised samples. Reporting of quantitative results for the diagnostically informative metabolites is almost universal. However, there is significant variability in both the concentrations reported and laboratory normal ranges.

Respondents were asked to report as they would to a physician at a non-specialist hospital, and to send a scan and/or table of quantitative results. The proportion reporting selected quantitative results on the diagnostic metabolite was virtually universal. The majority of laboratories provided a suggested/differential diagnosis. Most suggested some form of appropriate follow-up to confirm a putative diagnosis. A summary of the samples sent and number of respondents detecting the diagnostic acylcarnitines or suggesting the appropriate diagnosis is given in the table below.

Sample	Enzyme/transporter defect	Diagnostic Acylcarnitine	Respondents
7a	PropionylCoA carboxylase deficiency	C3	53/56
7b	Medium chain acyl CoA dehydrogenase deficiency (MCAD)	C8	56/56
7c	No acylcarnitine abnormality/fat oxidation defect?	C5OH	35/56
8a	Long chain hydroxyacyl CoA dehydrogenase deficiency	C16OH, C18:1OH, C18OH	48/54

	(LCHAD)		
8b	Carnitine transporter defect	C0	43/54
8c	Cobalamin B defect	C3	50/54

The results were, on the whole, very encouraging. The problems with sample 7c were to be expected, given the lack of a confirmed diagnosis. This sample did demonstrate the difficulties in interpreting quantitative values at, or close to, the cut-off value. In circulation 8 all the samples provided problems for some laboratories. 6 laboratories considered the LCHADD profile to be normal; 2 with values above their cut-off and 1 with a scan clearly demonstrating increased long chain hydroxyacyl metabolites. This suggests that under diagnosis of LCHAD may be a problem. 2 respondents considered the profile in sample 8b, the carnitine transporter defect, to be normal. 4 respondents considered the profile in sample 8c, the cobalamin B defect, to indicate multiple carboxylase deficiency. However, in this case the follow up testing proposed would have led to the correct diagnosis..

Once again, we are extremely grateful to the centres who have provided informative material for circulation. If any participants can provide samples in the future it would enormously facilitate the provision of this scheme, providing, as it does. genuine clinically derived samples for assay and interpretation, The current requirement would be for 5ml of anticoagulated whole blood or 80 50µl blood spots on Schleicher & Schuell 903 paper, accompanied by a short clinical history and confirmation that informed consent/local ethical approval for use of the sample had been obtained.