ERNDIM Qualitative Blood Spot Acylcarnitine Scheme

Annual Report London 2010

The ERNDIM blood spot acylcarnitine QA scheme was divided into two sections in 2010. The number of participating laboratories had grown to over 100 and the difficulties of obtaining sufficient amounts of informative sample from real patients, the hallmark of the scheme, had become insuperable. Approximately half of the participating laboratories were therefore allocated to an additional centre (Heidelberg, scheme organiser Claus-Dieter Langhans). This report refers only to the London section.
Two circulations (15 & 16) were sent out during 2010. The first was sent out in August, with a return date of 17^{h} September 2010 and the second in December with a return date of 14th January 2011. Samples were sent to 51 laboratories for the first circulation and 50 laboratories for the second circulation. Two laboratories withdrew from the scheme, one after the first circulation. Returns for circulation 15 were received from 44 (88%); 43 of these arrived by the initial due date of 17th Sep 2010. For circulation 16 valid returns were received from 42 (84%); 35 of these arrived by the initial due date of 14th Jan 2011. Extreme weather events (snow in Europe & floods in Australia) contributed to the late returns from circulation 16!

There were 5 laboratories who failed to make a return on either circulation. Four of these did not submit results in 2009. One laboratory reported on Circulation 15 only, and one resent their return for circulation 15 instead of their return for circulation 16.

Participants were asked to respond via email using a supplied report template, and to send a scan and/or table of quantitative results if possible. All but three laboratories responded by email, although some of these sent printouts on paper by post or fax as well. All 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 the number of respondents suggesting the definitive diagnosis as part of the differential is given in the table below.

Sample	Enzyme/transporter defect	Diagnostic Acylcarnitine	Respondents
15a	Glutaryl CoA dehydrogenase deficiency (GA-1 MIM 231670)	C5DC	39/44
15b	Methylmalonic acidaemia (MMA, MIM251000)	C3	29/44
15c	Carnitine uptake disorder (CUD/CTD MIM 212140)	Low free & acyl carnitines	43/44
16a	Medium chain acyl CoA dehydrogenase deficiency (MCADD, MIM 201450)	C8, C6, C10:1	42/42
16b	Propionyl CoA carboxylase deficiency (MIM 606054)	C3	41/42
16c	Normal		40/42

The sample which proved particularly difficult to interpret was sample 15b. This was from an adult patient, currently well, on vitamin & carnitine supplements, with well controlled B12 responsive methylmalonic acidaemia. The propionyl carnitine was not outside the reference range for a proportion of laboratories. Those laboratories reporting ratios rather than absolute values seemed to have fewer difficulties, as did those quoting age related reference ranges: neonatal ranges tended to be higher. 2 laboratories reported secondary assays on the original blood spot sample confirming the correct diagnosis by assay of methylmalonate. It is a matter of concern that >10% of respondents failed to detect raised glutaryl carnitine in sample 15a, which most laboratories considered clearly abnormal. The other samples were generally (>95%) correctly identified.

Once again, we are extremely grateful to the centres that have provided informative material for circulation. If any participants can provide samples in the future it would enormously facilitate this scheme, providing, as it does, genuine clinically derived samples for assay and interpretation. 3-4ml of lithium heparin anticoagulated whole blood or 60-70 30-50µl blood spots on Whatman (Schleicher & Schuell) 903 paper would provide sufficient material for one circulation. Samples for use in the scheme should be accompanied by a short clinical history and confirmation that informed consent/local ethical approval (as required in the referring centre) for use of the sample has been obtained.

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