

2. Quantitative Estimation Of Orotic Acid Is A Good Marker For Screening Of Some Of The Inborn Errors Of Metabolism

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Objective: Screening of children for IEM using quantitative urinary Orotic acid as a marker.

Subjects and method: This study included 150 high – risk children (Age range – 0 – 18 yrs) with lethargy, vomiting, failure to thrive, altered sensorium or convulsions. Quantitative estimation of urinary Orotic acid was performed on random urine sample using HPLC system by method of Brusilow S.W. Normal range of Orotic acid excretion was calculated as 0 – 12 umol / mmol creatinine. All 150 children were studied in detail for any IEM.

Results: Out of these 150 babies, only 8 samples showed values > 12 umol/mmol Creatinine. Rest all 142 babies showed values < 12 umol/mmol Creatinine. Average excretion was 1.95 umol/mmol Cr. \pm 2.57 (1 SD). Interestingly two babies with Galactosemia had nil Orotic acid excretion. Out of 8 elevated Orotic acids, we had special IEM diagnosis in 6 babies – Citrullinemia (1), OTC Deficiency (1), Argininosuccinic aciduria (1), Methyl Malonic Acidemia (2), Mitochondrial DNA defect (1), Organic acidemia under investigation (1). With some modification, we could reduce the run time from 1hr. to 45 min. without altering the results.

Conclusion: In absence of routine newborn screening, quantitative estimation of Orotic acid is a good marker for screening of certain IEM, especially in sick children. The procedure is non-invasive, fast and accurate. In developing countries like India, where incidence of Urea Cycle Disorders (especially OTC deficiency and Citrullinemia) and MMA is quite high, quick estimation of Orotic acid helps in counseling and planning of further management. Though this method is not suitable for mass screening of normal newborns, as one HPLC system can perform only 22 [1 hr run] or 30 [45 min. run] samples in 24 hrs, it is quite useful in selected sick newborns with high ammonia and neurological symptoms. This is also quite cost effective as cost per run comes to only 20 Euros per patient. In countries like India, cost effectiveness is an important factor.