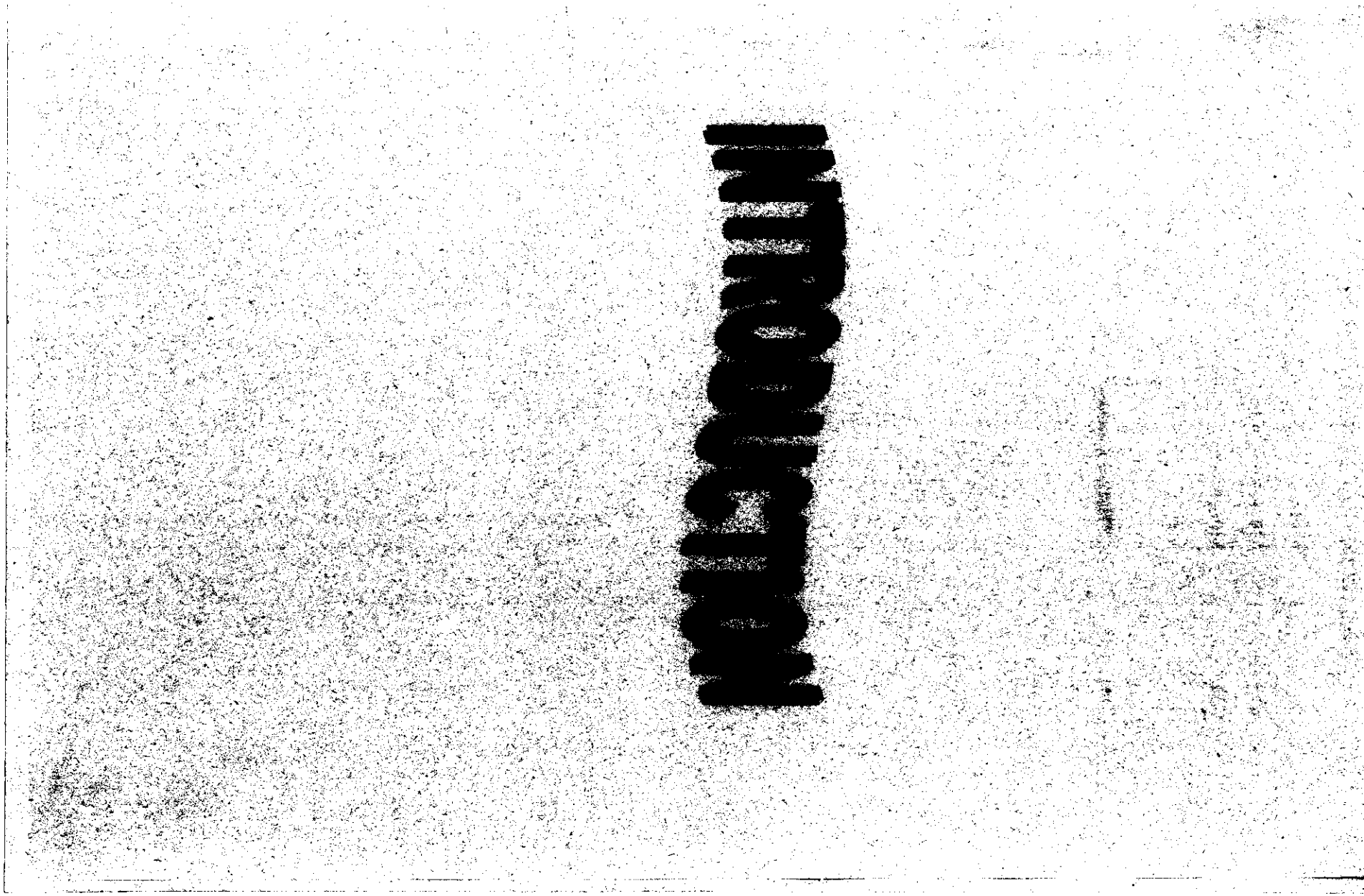

INTRODUCTION

Metabolic myopathy refer to a heterogenous group of conditions that have in common abnormalities of muscle dysfunction. Most recognized metabolic myopathies are considered primary, represent in born error of metabolism, and are associated with known or postulated defects that affect the ability of muscle fibers to maintain adequate ATP concentrations. These diseases are grouped into abnormalities of lipid, glycogen, purine and mitochondrial biochemistry ***(Wartmann, 1991).*** Metabolic Myopathies are subdivided into disturbances of anerobic cytoplasmic and aerobic mitochondrial metabolism ***(Richmann, 1993).***

Skeletal muscle is the most important site in the body for long-chain fatty acid metabolism becaue of its large mass and its rich density of mitochondria, where fatty acids are metabolised. Hereditary disorders of lipid metabolism that cause progressive myopathy are an important, relativley common, and often treatable group of muscle disease ***(Sarnat, 1996).*** L-Carnitine, an essential element of beta-oxidation, transport fatty acids across the mitochondrial membrane for energy production ***(Winter et al., 1995).***

The disorders of long–chain fatty acid oxidation show a rather similar range of clinical and biochemical features. Patients with severe defects usually present early with acute attacks of hypoketotic hypoglycemia and impaired liver function, or with cardiomyopathy or cardiac arrhythmia. In milder varients, skeletal myopathy with intermittent myoglobinuria develops later in life ***(Pollit 1995).***

Primary carnitine deficiency is a treatable disorders and therefore skeletal muscle biopsy and blood chemistry should be performed in all children with undiagnosed cardiomyapathy, treatment with oral carnitine must be intiated quickly to avoid sudden death ***(Vikre- Jorgenen, 1993).*** In secondary carnitine deficiency, the concentration of carnitine is reduced in serum and / or tissue because of carnitine loss that may be associated with many different conditions these conditions are separable into two groups :

(1) Those with increased loss or decreased intake of carnitine, and (2) those with accumulation of carnitine esters that are excreted in urine. Group (1) include renal fanconi syndrome, Type X1 glycogenosis, cystinosis, lowe syndrome, suboptimal diet, and renal dialysis. Group (2) include defects in B–oxidations of fatty acids, various types of organic acidemia, and treatment with anticonvulsant drug valproic acid. After reduced carnitine has been found in serum and / or tissue biopsies, one may consider treatment of children with primary as well as secondary carnitine deficiency with oral L. carnitine ***(Kliegman, 1996).***

Glycogen storage disease is a group of genetic metabolic disorders resulting from a defect in the synthesis or degradation of glycogen. GSD are classified according to the type of enzymatic defect and primary organs involved ***(Trimophe, 1997).*** Defects of muscle glycogen metabolism are well documented causes of metabolic myopathies, presenting with spectrum of symptoms which show some relationship to the positon of defective enzyme within the glycolytic pathway ***(Poulton et al., 1997).*** Administration of clondine could be another treatment modality in children with GSD, not only of Type VI but also I and III ***(Asami et al., 1996).***

Mitochondrial diseases are group of diseases involving muscle, brain, and other organs, associated with structural and functional abnormalities of mitochondria, producing defects in aerobic cellular metabolism, the electron transport chain, and the kryps cycle ***(Sarnat, 1996)***. Mitochondrial myopathies must be based on specific biochemical defects, as the clinical picture are both nonspecific and heterogenous ***(Bresolin et al., 1988).*** Plasma carnitine insufficiency provides an additonal clue to the diagnosis of mitochondrial myopathy ***(Campos et al., 1993)***. L- Carnitine therapy is claimed to be effective in patients with primary mitochondrial disease ***(Campos et al., 1993).***

Because specific therapy is available for many neuromuscular diseases and because of genetic and prognostic implications, precise diagnosis is important; laboratory confirmation is required for most diseases because of overlapping clinical manifestations ***(Sarnat, 1996).***

Electromyography can help distinguish myopathies from neuropathic muscle weakness. In myopathies, the E.M.G. characteristically shows a shortened mean duration and lower amplitude of the motor unit action potentials. In contrast, neuropathic patterens are characterized by spontaneous activity at rest and motor unit action potentials of increased duration and amplitude ***(Menkes, 1990).***

EMG is less useful in pediatrics than in adult medicine, in part because of technical difficulties in recording young children and in part because the best results require patients cooperations for full relaxtion and maximal voluntary contraction of a muscle. Most children are too frightened to provide such cooperation ***(Sarnat, 1996).***

Diagnosis must ultimately be based on direct assay of the enzyme involved, but preliminary indicators may come from determination of carnitine and intermediate metabolites in plasma, urinary organic acid profiling, and radioisotopic screening assays with lymphocytes or cultured fibroblasts ***(Pollit, 1995).*** Serum enzyme measurement, particularly creatine kinase, is used to aid in detection of suspected myopathy, to differentiate myopathy from neurogenic disease, to identify dystrophies at a preclinical stage, to detect female carriers of dystrophies, and to assess response to therapy ***(Panteghini, 1995).*** Plasma free carnitine is a good indicator of available carnitine ***(Veldee, 1994).***

A muscle Biopsy is valuable in differentiating primary mucle disease from other disorders ***(Menkes, 1990).*** Histochemical analysis is essential for complete evaluation of muscle histology because especial techniques are needed to demonstrate fiber types and storage materials. The important storage material identified in skeletal muscle are glycogen and lipid. In most storage disorder vacuoles are present in the fibers that contain the abnormal material, the vacuoles are seen with light microscopy, and the specific material is identified by histochemical reaction ***(Fenichel, 1997).***

The tremendous advances in the molecular genetics of such disorders has added remarkably to our understanding of the primary defects involved and possible heterogenity displayed at the molecular level ***(Panteghini, 1995).***