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Glucose 6 Phosphatase Dehydrogenase (G6PD) and neurodegenerative disorders: mapping diagnostic and therapeutic opportunities

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Glucose 6 Phosphatase Dehydrogenase (G6PD) and neurodegenerative disorders: mapping diagnostic and therapeutic opportunities

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Abstract:

Glucose 6 phosphate dehydrogenase (G6PD) is a key and rate limiting enzyme in the pentose phosphate pathway (PPP). The physiological significance of enzyme is providing reduced energy to specific cells like erythrocyte by maintaining co-enzyme nicotinamide adenine dinucleotide phosphate (NADPH). There are preponderance research findings that demonstrate the enzyme (G6PD) role in the energy balance, and it is associated with blood-related diseases and disorders, primarily the anemia resulted from G6PD deficiency. The X-linked genetic deficiency of G6PD and associated non-immune hemolytic anemia have been studied widely across the globe. Recent advancement in biology, more precisely neuroscience has revealed that G6PD is centrally involved in many neurological and neurodegenerative disorders. The neuroprotective role of the enzyme (G6PD) has also been established, as well as the potential of G6PD in oxidative damage and the Reactive Oxygen Species (ROS) produced in cerebral ischemia. Though G6PD deficiency remains a global health issue, however, a paradigm shift in research focusing the potential of the enzyme in neurological and neurodegenerative disorders will surely open a new avenue in diagnostics and enzyme therapeutics. Here, in this study, more emphasis was made on exploring the role of G6PD in neurological and inflammatory disorders as well as non-immune hemolytic anemia, thus providing diagnostic and therapeutic opportunities.

KEYWORDS: Neurodegenerative disorders; Glucose 6 phosphate dehydrogenase; Metabolic disorders; Hemolytic anemia

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