Litchi-related Hypoglycemia: A Public Health Challenge, an Endocrine Opportunity

Sir,

Hypoglycemia has long been recognized as a clinically significant complication of diabetes therapy.[1] Nondiabetic hypoglycemia, too, is a well-characterized syndrome, with multiple etiologies like sepsis among others.[2]

Apart from its clinical implications, hypoglycemia has major public health implications as well. Nonsevere/mild hypoglycemia severely impairs quality adjusted life year.[3] Severe hypoglycemia may lead to life-threatening and health-threatening situations, which may impair individual and societal health. Drivers of commercial vehicles or heavy machinery, and workers in jobs, which require split-second reflexes (for example, air traffic and railway movement controllers), may make mistakes during subtle neuroglycopenia, which may negatively influence community health. This pubic impact is recognized in many countries, which regulate granting of driving licenses to persons on treatment with high-risk of hypoglycemia.[4]

In recent years, a novel public health facet of hypoglycemia has emerged. Epidemics of acute encephalitic fever, occurring in Bangladesh, India, and Vietnam were earlier attributed to various causes.[5] In India, this has been reported from the eastern state of Bihar, and especially from the district of Muzaffarpur.[6] The occurrence of these events coincide with the annual harvest of the lychee or litchi fruit (*Litchi sinensis*) family. Government health authorities have now begun reporting the cause of death as hypoglycemia, rather than acute encephalitis, in this often-fatal syndrome. Though the poor prognosis associated with litchi-induced hypoglycemic encephalopathy is a cause of concern, our understanding of its pathogenesis offers optimism and hope.

Litchi are believed to contain amino acids (methylenec yclopropylglycine (MCPG), a homologue of hypoglycin A) that interfere with gluconeogenesis and fatty acid β-oxidation.[7] In the setting on malnourished children with depleted hepatic glycogen stores (due to missed meals and poverty related starvation), hypoglycemia sets in and due to increased circulating levels of MCPG due to excessive litchi consumption, even the gluconeogenesis and beta oxidation of fatty acids are blocked, resulting in severe refractory hypoglycemia along with accumulating aminoacidaemia, which results in encephalopathy.

Hence, it has to be realized that this is a social problem as many children from the economically weaker sections of the society may be binging on the litchi fruit (which is cheap and available in abundance in the harvest season), at the cost of missing proper meals/evening supper, predisposing them to life-threatening hypoglycemia later in the day/night. The concentration of MCPG/hypoglycin-A, along with the age, nutritional, and immunologic status of the child influence the natural history and outcome of the illness.[7] It is a social tragedy that children have to die in 21st century due to lack of timely and appropriate correction of hypoglycemia, which is an easily treatable condition and involves minimal costs. Hence, increasing awareness about symptoms of hypoglycemia, especially the neuroglycopenic symptoms of hypoglycemia should be the focus of preventive and social health specialists.

Now that the metabolic of encephalopathy is known, policymakers and researchers can work known, preventing and managing the disease. Public education and awareness campaigns must be started in endemic regions as a primary preventive measure. It has been suggested that a proper evening meal can prevent this severe life-threatening hypoglycemia in children. Efforts should also be made to improve the nutritional status of children in these areas. Secondary prevention should aim at early identification and management of the illness, along with timely treatment using oral and intravenous glucose.

The role of the endocrinologist is of utmost importance in secondary and tertiary preventions. Optional correction of glycemia, fluid, and electrolyte balance, along with the management of starvation ketosis, is the responsibility of the endocrinologist. National and regional professional associations should work closely with health care professionals in the affected areas to formulate effective clinical decision pathways and treatment algorithms, to optimize outcome.

At the same time, the health care system should respect the need for quaternary prevention. Not all encephalopathy is due to hypoglycemia, and litchi-induced hypoglycemia should not be used as a convenient label for all febrile illness as an opportunity to utilize their skills for the cause clinical, as well as public health. Research must continue into unravelling other causes of febrile encephalopathy as well.

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