

Counting the cost of hypoglycaemia

Hypoglycaemia as a clinical problem is almost entirely the result of the treatment of diabetes. Most of the problem relates to insulin use. Previous work has suggested that hypoglycaemia is more feared than microvascular disease as a complication of diabetes and its treatment (Pramming et al, 1991). These facts are widely accepted by the diabetes community, yet we consistently downplay the size of the problem.

There is a strong case that lowering HbA_{1c} reduces the risk of microvascular disease and, to a lesser extent, macrovascular problems (Diabetes Control and Complications Trial [DCCT] Research Group, 1993; UK Prospective Diabetes Study Group, 1998; Holman et al, 2008). It is also clear that as HbA_{1c} is lowered the risk of hypoglycaemia increases in a linear fashion (DCCT Research Group, 1997). Thus, there is a risk–benefit balance that needs to be achieved. Too high an HbA_{1c} is associated with an unacceptable risk of vascular complications; too low an HbA_{1c} with an unacceptable risk of hypoglycaemic complications.

Presently, guidance could be interpreted as suggesting that it is acceptable to maintain an elderly lady with type 2 diabetes on insulin at an HbA_{1c} level of 5.5% (37 mmol/mol) – despite the limited evidence that this will prevent major diabetes-related complications and the considerable risk of severe hypoglycaemia, possibly leading to injury. The inevitable conclusion is that there must be an acceptable HbA_{1c} range, with a lower limit as well as an upper one. Developing an HbA_{1c} treatment range would involve some careful thought as the risk of hypoglycaemia varies between patient groups and treatments, but the notion deserves consideration by clinicians.

One of the reasons that the significance of hypoglycaemia is underestimated is the difficulty of measuring the problem. Patient stories of episodes of hypoglycaemia stick in my mind. One man, having had a severe hypoglycaemic episode on a beach, received assistance from police, fire, ambulance, coast guard and lifeboat services – followed by admission to the accident and emergency department of a local hospital (interestingly, no diabetes specialist was involved in his hospital care). With the involvement of five emergency services and an inpatient stay, the economic cost of managing that individual hypoglycaemic episode was no doubt considerable, but it is difficult to quantify at a population level.

Some recent international collaboration by teams from Germany, Spain and the UK has been helpful in trying to quantify the costs of hypoglycaemia (Hammer et al, 2009; Lammert et al, 2009). Hammer et al (2009) performed a retrospective study of people with type 1 or type 2 diabetes with previous severe hypoglycaemia – defined as requiring third party assistance. Their survey of more than 600 people with diabetes shows that hypoglycaemia remains a frequent and major side-effect of insulin treatment – some 38.8% of people with type 1

diabetes had experienced a severe hypoglycaemic episode in the previous 12 months, and 12.9% of people with type 2. Most episodes were managed by friends and family, but a large number of those surveyed required the care of paramedics or a hospital admission (23.1% of people with type 1 diabetes and 52.6% of people with type 2). In the UK, virtually all of those who required inpatient care were managed in accident and emergency departments, with little diabetologist involvement.

There is a considerable personal cost to those with diabetes following a severe hypoglycaemic episode. The event causes disruption of lifestyle, loss of confidence and perhaps an unwillingness to run blood glucose within a desirable range in the future. While it is not possible to quantify these personal costs, Hammer et al (2009) attempted to measure the economic costs of the events.

Previous estimates indicated that the UK spends approximately £13 million on ambulance care and hospitalisation to treat severe hypoglycaemia (Leese et al, 2003). Hammer et al (2009) calculated that the cost of a severe hypoglycaemic episode in an individual with type 2 diabetes on insulin requiring hospitalisation was £892/episode. This included the cost of pre-hospital treatment and ambulance services, as well as inpatient care and follow-up costs. A small amount was included in the figure to account for indirect costs resulting from the episode (e.g. absence from work), but the authors acknowledge that these costs are difficult to measure. The costs were found to be slightly lower for people with type 1 diabetes experiencing a severe hypoglycaemic episode requiring hospitalisation, at £887/episode. The costs in the UK compare favourably with those from Germany and Spain.

Clearly, it is in the interest of people with diabetes that the burden of hypoglycaemia be reduced. Additionally, in times of ever tighter NHS budgets, the need to reduce the incidence of hypoglycaemia is also economic.

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