

Use of Insulin Analogues Provides Greater Benefit in Preventing Microvascular Complications in People With Type 2 Diabetes Than Human Insulin: A Literature Review

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Diabetes is one of the most common chronic diseases globally, with type 2 diabetes being the most prevalent form of the disease. Older adults make up the largest segment of people with type 2 diabetes, with ageing and obesity both being predominant factors of type 2 diabetes. This review evaluates whether insulin analogues, compared with human insulin, provide greater benefit to people with type 2 diabetes in terms of reducing the risk of microvascular complications, such as retinopathy, nephropathy, and neuropathy. The current literature review suggests that the different insulin analogues are comparable to human insulin in reducing hyperglycemia (HbA1c) and in terms of reducing the risk of microvascular complications in people with type 2 diabetes. However, analogues may help people with type two diabetes achieve glycemic targets more safely than human insulin, because analogues have more predictable and controllable pharmacokinetic and pharmacodynamic profiles. Pharmacokinetics refers to how quickly insulin enters and leaves the bloodstream, while pharmacodynamics refers to how strongly and for how long it lowers blood glucose. Rapid-acting analogues such as lispro have faster action and shorter duration on blood glucose than human insulin. This allows dosing closer to meals and better control of postprandial glucose excursions when needed. Long-acting analogues such as glargine provide greater basal insulin coverage than human insulin, have a flatter and more prolonged action than human insulin and therefore tend to have fewer episodes of hyperglycemia symptoms and especially nocturnal hypoglycemia. Raslova et al. (2004) compared people with type 2 diabetes using a randomized form of insulin analogues or human insulin form, revealing a 38% lower chance of nocturnal hypoglycemia in those who use insulin analogues. However, despite the favourable and customizable pharmacokinetics and pharmacodynamics, the current literature has not shown that analogues have a distinct advantage over human insulin in terms of clinical reduction of microvascular complications. More evidence is needed.