16. THE USE OF NEW INSULIN ANALOGS IN TYPE 1 DIABETES

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Introduction. Diabetes mellitus is a metabolic condition with diverse causes, marked by persistent high levels of blood sugar and disruptions in carbohydrate, protein, and fat metabolism. It arises from deficiencies in insulin secretion, its effectiveness, or a combination of both. Managing type 1 diabetes involves supplementing β cell functions to achieve normal blood glucose levels. New insulin analogs, like rapid-acting (aspart, lispro, glulisine) and long-acting basal analogs (glargine, detemir, deglutec), have been formulated to allow for a closer replication of a normal insulin profile.

Aim of study. Updated information regarding the use of new insulin analogs in patients with Type 1 Diabetes were analyzed to demonstrate the impact of analog therapy on achieving normoglycemia without hypoglycemia and complications of diabetes mellitus.

Methods and materials. We have accessed information from pertinent literature available in books, guidelines or databases like PubMed, NCBI, and ScienceDirect. This was achieved by employing specific keywords such as „type 1 diabetes", „insulin analogs", „pharmacokinetic", „pharmacodinamic".

Results. Several research studies have indicated that individuals with diabetes who use insulin analogs express higher satisfaction with their insulin therapy compared to those utilizing regular human insulin products. In a 64-week prospective, multicenter, randomized, open-label, parallel-group study involving 423 patients with type 1 diabetes undergoing basal-bolus therapy, participants were randomly allocated to either human insulin or insulin aspart as their bolus insulin. Treatment satisfaction was evaluated using the WHO Diabetes Treatment Satisfaction Questionnaire. Scores related to perceived hyperglycemia were lower in the insulin aspart group, suggesting that individuals using aspart perceived elevated blood glucose levels to be less pronounced than those using human insulin (P=0.005). The insulin aspart group also reported greater treatment flexibility compared to those using human insulin (P=0.022). The recent target for insulin administration involves delivering 0.5 – 1.0 IU/kg/day or higher doses to restore metabolic balance. The total daily dose depends on factors such as age, body weight, diabetes duration and stage, pubertal stage, carbohydrate intake, local insulin administration, self-monitoring, HbA1c levels, daily routine, and the presence of acute complications like infections or sick days. New insulins, such as degludec, can be used alone or combined with insulin aspart for better glycemic control, reduced variability, and a lower incidence of hypoglycemia.

Conclusion. The availability of well-established rapid-acting and long-acting insulin analogs has empowered a greater number of individuals with type 1 diabetes mellitus to achieve improved glucose targets. This has been associated with reduced rates of hypoglycemia and an enhanced quality of life compared to what was achievable with short-acting and long-acting human insulin.