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Insulin Glulisine

A Viewpoint by Jürgen Eckel

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Recent results of the UKPDS (United Kingdom Prospective Diabetes Study) convincingly show that tight blood sugar control as a result of intensified insulin therapy leads to delayed progression of microvascular complications in both type 1 and type 2 diabetic patients. Molecular biology technologies have been used to generate new insulin molecules with modified pharmacodynamic properties in order to achieve improved glycaemic control. This has been well documented for insulin lispro and insulin aspart, two rapid-acting insulin analogues which have been in clinical use for several years.

Insulin glulisine is the third rapid-acting insulin analogue approved for clinical use in the US and Europe. The therapeutic efficacy of insulin glulisine has been extensively evaluated in a number of large clinical studies and it has been convincingly demonstrated that this novel insulin analogue can be efficiently used to control prandial blood glucose levels both in type 1 and type 2 diabetic patients. The pharmacokinetic properties are retained in several subpopulations and the tolerability is comparable to regular human insulin or other insulin analogues. Moreover, the clinical data clearly show that insulin glulisine has essentially the same therapeutic efficacy as insulin lispro and insulin aspart.

Despite a comparable therapeutic efficacy regarding blood glucose control, insulin glulisine might exhibit an additional benefit that needs to be further explored in the future. Insulin glulisine has been shown to promote preferential activation of insulin receptor substrate (IRS)-2, which plays a crucial role in growth and survival of pancreatic β-cells, with only a marginal activation of IRS-1 in a number of different cells and tissues.[1] Insulin glulisine has been shown to have a pronounced anti-apoptotic activity and thus might be more potent in preserving β-cell mass when compared to regular insulin.[2] However, a recent study in mice showed that insulin and insulin glulisine induce a comparable activation of both IRS-1 and IRS-2 in liver and muscle.[3] Future clinical studies may shed light on the question of whether insulin glulisine exerts a β-cell protective action in humans and slows the progress of type 2 diabetes mellitus. This would clearly extend the therapeutic potential of insulin and its analogues in the treatment of diabetes mellitus. ▲

References

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