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A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.

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Inhaled insulin

An inhaled insulin product (Exubera®) was marketed in the United States from September 2006 to October 2007. This was a powdered form of recombinant human insulin, delivered via an inhaler, and provided more rapid absorption of fast-acting insulin than subcutaneously injected insulin. This provided a closer match to the natural physiological release of insulin at mealtimes.

Exubera® was a short-acting insulin, and patients were still required to inject long acting insulin for their basal coverage. In clinical trials efficacy in terms of blood glucose reduction, HbA1c control, and incidence of hypoglycaemia were all equivalent compared to multiple daily injections of short-acting insulin. Understandably quality of life and patient satisfaction were significantly greater in patients receiving inhaled insulin. There were some concerns about small reductions in pulmonary function associated with Exubera® and the lack of longer term data around this, and about the cost-effectiveness of inhaled insulin. In October 2007 the sponsor withdrew the product from the market due to a lower than expected acceptance by physicians and patients.

At the recent 69th American Diabetes Association meeting however, data from several studies investigating a new form of inhaled insulin called technosphere insulin were released. This insulin has an onset of action that is evident within 10 minutes and peaks at 40 minutes, compared to 70 minutes with subcutaneous lispro insulin. This results in a profile closer to normal physiological glucose reduction.

One study compared inhaled technosphere insulin with a rapid-acting analogue (lispro), both given in combination with a long-acting analogue, in a group of patients with type 1 diabetes. Use of inhaled insulin resulted in comparable reductions in HbA1c (a drop of 0.17% in both groups), significantly greater decreases in fasting plasma glucose levels (-2.5 mmol/L vs -1.3 mmol/L), more favourable 1-hour postprandial blood glucose levels (9.2 mmol/L vs 11.2 mmol/L, $p=0.002$), less weight gain (a decrease of 0.5kg vs a gain of 1.4kg, $p<0.001$), and less risk of hypoglycaemia (OR 0.49, $p=0.01$).

In a separate study, technosphere insulin appeared to have no adverse effect on pulmonary function, with no difference in FEV₁ from baseline to 24 months. The administration device is very similar to a regular inhaler, and may prove to be a viable option for patients who need short-acting insulin coverage for mealtimes. After an initial setback with Exubera®, the development of technosphere inhaled insulin, which still awaits FDA approval, appears promising.

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FOR FURTHER INFORMATION – CONTACT THE PHARMACY DEPARTMENT ON 82751763 or email: chris.alderman@rgh.sa.gov.au
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