Pfizer’s $3bn Folly
For a while Big Pharma looked towards inhalable insulin with Pfizer leading the charge with its product Exubera, touted as a potential $2bn a year blockbuster. However, market uptake was beyond disappointing with quarterly sales figures sitting around the $4m mark, and thus the firm exited the market in 2007 incurring losses of $2.8bn and a manufacturing strategy in disarray.

Oral Insulin: All Mouth, or an Injection of Hope for Type 1 Diabetes?
23-May-2013

Can oral insulin succeed where other alternative delivery methods have failed? Dan Stanton, from in-Pharmatechnologist.com assesses its chances.

When Danish drugmaker Novo Nordisk launched the world’s first insulin treatment for Type 1 diabetes some 90 years ago, syringes were the only delivery technology with which patients could administer the product.

Syringes continued to be the most widely-used delivery method for the next fifty years until – in the mid-1980s – the first insulin pens were launched in response to patient demand for more convenient and safer alternatives.

Brittany Maher-Kirk of Diabetes UK told in-Pharmatechnologist.com: “Very few people use syringes to inject insulin anymore. The vast majority of people with diabetes now will use insulin pens, and there is a wide variety available to suit the different manufacturers.”

Pens such as Novo Nordisk’s NovoPen, Sanofi-Aventis’ OptiSet, and Lilly’s HumaPen claim to offer users a discreet syringe alternative that ensures compliance with treatment.

However, there are some Type 1 diabetes patients who haven’t made the switch like Sara Kirsch who told me she injects insulin four times a day and currently uses Eli Lilly’s Lispro (for meals) and Sanofi’s Lantus for long-acting coverage at night.

"On the whole, the injections are fine by me for the time being. I have had no issues relating to syringes/vial delivery other than an occasional bruise."

Furthermore, Sara remained indifferent to the pen, and although she was given it to try she said: "It just didn’t interest me."

"As for the pump,” she continued, "the idea disgusts me. I like to be free from having to eat at a specific hour because there is insulin being pumped into me at a certain hour, and the thought of having something dug into your side and attached under your closes sounds horrific."

Oral insulin
But, despite the widespread acceptance of injections, whether by pen or – like Sara - syringe, the drug industry has continued to plough millions of dollars into developing alternative delivery methods.

The current R&D focus of choice is oral delivery which, following numerous failed efforts to create inhalable insulin [see fact box], is being examined by several of the diabetes sector’s major players.

Last week, Israeli firm Oramed Pharmaceuticals announced its ORMD-0801 candidate had received clearance from the FDA (US Food and Drug Administration) to initiate oral insulin trials in the US last week.

Spokesperson for Israel-based Oramed Pharmaceuticals, Aviva Sherman said that the oral form of insulin it was developing could theoretically be marketable within five years, but for type 1 sufferers it would “be in addition to injections, though with the hope of decreased need for injections and an overall more stable glucose state.”

She added Oramed’s oral insulin is being developed primarily to serve type 2 diabetes which “makes up 90% of the diabetic population,” and is therefore a longer-acting candidate than other oral developments, such as those being undertaken by Biocon and Tamarisk.

Novo Nordisk’s latest candidate, too, is focused on type 2 though - like Oramed - the company has a hope that a variant for type 1 could follow initial regulatory approval.

"In type 1 diabetes where endogenous insulin production is completely lost, insulin must be dosed with very little variability,” said Senior VP of Diabetes
Research at Novo Nordisk, Peter Kurtzhals. "And although clearly a hope, we expect that could be more difficult within an insulin tablet."

**Finger-Pricking Good?**

Whether Oramed or Novo Nordisk succeeds in an insulin alternative, Sara Kirsch remains subdued.

"If there were any other easier, less invasive means available, I would not jump at it in an instant," she said. "I would wait about 5 years and watch the guinea pigs go at it first and then see what side effects come out."

For Sara and many with her condition it seems it is not the delivery that is the issue but rather the constant monitoring of glucose levels.

"It's actually the pin pricking of the fingers about 3 to 6 times a day that bothers me most. The syringes/insulin injections are no big deal but my fingers are all calloused from years of checking my blood sugar, sometimes so much so that no blood comes out at times."

Resistance to the product was down to the necessity to begin insulin earlier than a patient may have had to previously, as well as the inconvenient size of the inhaler, yet what really hammered the final nail in was clinical tests that led to warnings Exubera could increase the risk of lung cancer.

When Exubera fell, others followed and within the space of three costly months in 2008, both rivals Novo Nordisk and Eli Lilly's inhaled insulin programmes came crashing down with investments of $300m and $120m, respectively, lost into the ether.