# Understanding the double-edge sword of steroids

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Glucocorticoids are a type of steroid hormone that are used to treat everything from asthma to arthritis, but the impact of these powerful anti-inflammatory drugs – particularly in prolonged, low-doses – remains to be fully understood.

Now researchers from Flinders University are on a mission to find out how long-term steroid treatment for arthritis and pituitary tumours affect the body's metabolic and cardiovascular mechanisms.

Between half and one per cent of the country's population take steroids, or about 1000 people in South Australia, with the over 50s the most

common consumer.

“Research has already proven that high doses of steroids can cause diabetes, heart disease and weight gain but most patients are treated with low doses over a long period of time,” chief investigator Dr. Morton Burt (pictured), a senior lecturer in the School of Medicine, said.

“Yet there’s less evidence on the effects of low-dose steroid therapy,” he said.

“So what we want to know is whether steroids mainly reduce insulin production or make the body resistant to insulin.

“Without sufficient insulin the body can’t reduce glucose – and too much glucose in the blood causes diabetes.”

Dr. Burt’s preliminary studies have shown that therapeutic doses of steroids only increase blood glucose after eating. After eating most glucose is taken up into muscle. This suggests steroids may predominantly cause insulin resistance in muscle.

So far Dr. Burt has performed detailed metabolic studies on about a dozen people before and one week after commencing steroid treatment and has also studied a similar number who have been taking steroids for a long period of time.

“We give patients an injection of insulin to measure how much insulin they secrete over a 60 minute period,” Dr. Burt said.

“Subjects also have a six hour infusion of insulin and glucose to measure how resistant they are to insulin and whether the resistance is in the liver or muscle or both.”

In another study, Dr. Burt is studying patients with pituitary tumours to determine what impact a higher or lower dose of steroids has on their risk of heart disease.

“For most of us, our blood vessels become more relaxed after eating but our hypothesis is that this will not happen in people who are using steroid therapy.”

Dr Burt, an endocrinologist at Southern Adelaide Diabetes and Endocrine Services, said the aim of his research is to develop new treatments that reduce the risk of heart disease in people who have steroid-induced diabetes.

“Steroids are crucial in the treatment of many chronic diseases, yet they also have harmful side-effects. So if we can better understand these effects it will pave the way for therapies that specifically reverse the major metabolic abnormalities they induce – and reduce cardiovascular risk.”

Dr. Burt is supported by a South Australian Health Practitioner Fellowship and recently won a Flinders University’s 2011 Vice-Chancellor’s Awards for Early Career Researchers.

He and Dr. Elke Sokoya, a senior lecturer in human physiology in the School of Medicine, each have won $39,770 in research funding in the latest Diabetes Australia Research Trust Awards.

Provided by Flinders University