Insulin resistance under-diagnosed in non-diabetics with Parkinson's disease

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Almost two-thirds of non-diabetic patients with Parkinson's disease (PD) may be insulin resistant, despite having normal blood sugar, report scientists in the *Journal of Parkinson's Disease*. Their findings suggest that insulin resistance in PD is a common and largely undetected problem, especially in patients who are overweight.

Reduced glucose tolerance has long been recognized as a potential risk factor for PD, and there is increasing scrutiny of insulin resistance as a pathologic driver of neurodegeneration. The key link between the two conditions appears to be insulin resistance, a potentially reversible condition that not only predisposes individuals to type 2 diabetes (DM2) but is also associated with neurodegeneration. However, the prevalence of insulin resistance in PD is unknown.

"There is growing interest in the study of this relationship and the use of diabetes medications in the treatment of PD. However, there is little information regarding the prevalence of insulin resistance in PD," explained lead investigator Michele Tagliati, MD, from the Department of Neurology, Cedar-Sinai Medical Center, Los Angeles, CA, USA. "This study is the first to address this question in a large population of non-diabetic patients."

Investigators tested 154 non-diabetic PD patients for fasting blood sugar and insulin to assess the prevalence of insulin resistance and to correlate insulin resistance with other metabolic indicators, motor and non-motor symptoms of PD, and quality of life. Based a widely used formula, known as the HOMA index, they determined how many of these patients had a reduced response to their own insulin. Among other measurements, their weight and height were recorded and their movement and cognitive performance were measured.

Results showed that nearly two-thirds of patients (58.4%) had undiagnosed insulin resistance, despite normal fasting glucose and, in many cases, normal hemoglobin A1c (HbA1c), a test that is regularly performed for type 1 and type 2 diabetes. Their data confirmed previous studies that insulin resistance is more than double in obese compared with lean individuals, but the investigators also found a substantially higher percentage (41%) of lean PD patients with insulin resistance. They found no correlation between insulin resistance and cognitive decline.

The potential impact of this study is two-fold. Weight gain and obesity is a major public health challenge and insulin resistance appears linked to body weight. These findings could lead to increased screening of PD patients to detect and correct this condition.

The second and more specific impact is that identifying patients with insulin resistance could allow for personalized medicine, whereby PD patients with insulin resistance may be treated with medications targeted to reverse the condition. Research on the use of diabetic medications for PD, such as GLP-1 agonists like exenatide and liraglutide, is ongoing.

"Now that, for the first time, we understand how common insulin resistance is in non-diabetic patients with PD, we can begin to address this public health challenge," commented Dr. Tagliati. "This increases the importance of finding new treatments and lifestyle interventions that can address this metabolic dysfunction with multiple implications, from diabetes to neurodegenerative disorders like PD and Alzheimer's disease."

More information: Elliot Hogg et al, High Prevalence of Undiagnosed Insulin Resistance in Non-Diabetic Subjects with Parkinson's Disease, *Journal of Parkinson's Disease* (2018). DOI: 10.3233/JPD-181305

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