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Clinical/Scientific Notes

Hypothyroidism and Parkinson's Disease and the Issue of Diagnostic Confusion

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Abstract: Development of hypothyroidism may easily be overlooked when occurring together with Parkinson's disease (PD), because many of the symptoms of the two disorders are similar. We report on a case of a woman suffering from both PD and hypothyroidism and review the literature on the subject. © 2003 Movement Disorder Society

Key words: hypothyroidism; *on/off* fluctuations; Parkinson's disease

Development of hypothyroidism in a patient with Parkinson's disease (PD) may be overlooked because the clinical manifestation of the two disorders are similar.[1] Both diseases have a high prevalence among the elderly, so their coexistence is possible in thousands of people.[1] Despite this expectation, we found few reports in the literature that recognized this linking of events. We present a case of hypothyroidism masked by PD and review the literature on the subject.

Case Report

A 72-year-old woman was diagnosed with PD at the age of 55, when she presented with a resting right-hand tremor. She was treated with amantadine and carbidopa/levodopa (C/L) with excellent response. As she developed stiffness, gait disturbance, and tremor in both arms, the dose of C/L was increased and bromocriptine was added. Seven years after the onset of the disease, she developed *on/off* fluctuations and was admitted to our department because, for the past 11 months, *on/off* fluctuations were refractory to all therapeutic actions and she was in an almost continuous *off* state. At that time, she was taking 50/200 mg of C/L, bromocriptine 3.75 mg, and entacapone 200 mg every 3 hours. She had lethargy, asthenia, anorexia, constipation, and muscle cramps. On physical examination, dry skin, brittle nails, and bradycardia were noted. Laboratory tests revealed anemia, with the following values: red blood cell count, 2.39 × 10^6 /μl; hemoglobin, 8.3 g/L; hematocrit, 30.2%; and mean corpuscular volume, 80 fL. The serum albumin level was 2.9 g/dl, and cholesterol and triglyceride levels were 553 and 2,416 mg/dl, respectively. Endocrine investigation revealed autoimmune thyroiditis and hypothyroidism, with a thyroxine level of 0.25 ng/ml (normal, 0.8–2.0), thyroid stimulating hormone of 84.42 μUI/ml (normal, 0.3–4.0), and antithyroid peroxidase antibody of 175 UI/ml (normal, 0–50).

Treatment with levothyroxine sodium was started and slowly incremented to a maintenance dose of 150 μg/day. After 20 days of treatment with thyroid hormones, lethargy, constipation, and muscle cramps disappeared and the *off* period decreased by 40% (7 hours of *off* periods per day). She noted a new improvement when an oral levodopa/carbidopa/ascorbic acid solution was administered at hourly intervals. The initial hourly dose was calculated from daily C/L dose divided by the number of hours during which it was consumed, and dosage was titrated until the patient obtained the optimal clinical response. No other medications were changed. Three months later, all laboratory tests returned to normal and the patient experienced only 3 hours of *off* periods per day.

Discussion

PD and hypothyroidism share many clinical characteristics.[1] Development of hypothyroidism, which may be characterized initially only by hypokinesia, therefore, can be easily overlooked during the course of PD. However, commonly used textbooks of neurology do not mention the possibility of concomitant development of PD and hypothyroidism.[2,3] We found only one review which acknowledged that common geriatric illnesses such as PD, Alzheimer's disease, depression, psychosis, and renal failure can mask symptoms of thyroid disease.[4]

A recent report estimated the prevalence of PD in Europe after the age of 65 years to be 1.6%.[5] The prevalence of hypothyroidism among the elderly varies widely according to the series, from 2.3% in Bahemuka's series to 7.8 to 12% in others.[6–8] Because of the high prevalence of both, these diseases could be expected to develop at the same time in thousands of people.[1] Despite this expectation, we found only five reports in the literature that recognized this linkage of events.[1,9–11] Berger and Kelley[11] calculated the incidence of hypothyroidism as 6.6% among Parkinson patients (more than double the 2.3% in elderly patients of Bahemuka's series), and because of this unexpected high frequency, they recommended the early evaluation of thyroid function in all patients with PD. The results of Johannessen and colleagues[10] did not point to a higher incidence of hypothyroidism in patients with PD compared with a healthy population. However, this study may have methodological biases, because no control group was included, they did not give the age of the patients, and the sample was quite small. Even so, the authors suggested that the possible concomitant occurrence of hypothyroidism in PD patients had to be taken into consideration.[10]

On the other hand, hypothyroidism and PD are known to have major effects on gastrointestinal motility. Thyroid dis-

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function impairs gastric emptying and small bowel motility, causing in the latter, subtotal villous atrophy.[12] Parkinsonian patients also have an impaired gastric emptying and abnormal motility of the upper gastrointestinal tract. All these conditions can result in an erratic absorption of levodopa, and they might be the cause of "random" fluctuations in parkinsonian mobility.[13,14] It is possible that the clinical deterioration in this patient may be, in part, explained by impaired levodopa delivery to the proximal small bowel. The treatment with levothyroxine could improve levodopa absorption. In addition, L-dopa solution administration may allow better intestinal absorption, because its gastric emptying occurs continuously. Therefore, drug levels may become stable and, thus, the dopaminergic stimulation more continuous than with L-dopa tablets.

Our patient is an example of PD resistant to levodopa secondary to hypothyroidism, which was reversed by thyroxine replacement therapy. The chronic course of PD and its various manifestations may mask the symptoms of other concomitant diseases that may mimic PD. So, it is possible that the hypothyroidism is more easily overlooked in PD patients than among the general population. For this reason, we recommend assessing thyroid function in medicated PD patients with *on/off* fluctuations refractory to several therapeutic adjustments.

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Botulinum Toxin B Reduces Sialorrhea in Parkinsonism

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Abstract: We report on our open-label experience with botulinum toxin B for the treatment of severe sialorrhea associated with parkinsonism. Nine adult patients with parkinsonism and medically intractable sialorrhea were treated with botulinum toxin B (1,000 units into each parotid gland using superficial landmarks). After treatment, patients experienced a 61% mean subjective improvement and a 42% mean reduction of quantitative saliva production. There were no adverse effects seen in any subjects. Mean peak benefit from injections lasted 14 weeks. We conclude that denervation of salivary glands with botulinum toxin B produces excellent reduction of excessive salivation associated with parkinsonism. © 2003 Movement Disorder Society

Key words: botulinum toxin B; parkinsonism; sialorrhea

Sialorrhea is a common complication of parkinsonism[1] and treatment options are limited. Treatment with antiparkinsonian medications such as levodopa (L-dopa) may not improve sia-

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