Stability Analysis of Two-delay Differential Equation for Parkinson's Disease Models with Positive Feedback

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Abstract : Parkinson's disease (PD) is a heterogeneous movement disorder that often appears in the elderly. PD is induced by a loss of dopamine secretion. Some drugs increase the secretion of dopamine. In this paper, we will simply study the stability of PD models as a nonlinear delay differential equation. After a period of taking drugs, these act as positive feedback and increase the tremors of patients, and then, the differential equation has positive coefficients and the system is unstable under these conditions. We will present a set of suggested modifications to make the system more compatible with the biodynamic system. When giving a set of numerical examples, this research paper is concerned with the mathematical analysis, and no clinical data have been used.

Keywords : Parkinson's disease, stability, simulation, two delay differential equation
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