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Biography

Kadime Gogebakan, completed her doctorate at Near East University at the age of 45. She is an Information Technologies Directorate Engineer at the Northern Cyprus campus of Istanbul Technical University, a leading university.

A Novel Fuzzy System For Predicting Drug Doses In Hypertensive Patients With Chronic Kidney Disease And Type 2 Diabetes Mellitus

Abstract:

Incorrect drug dosages can lead to side effects, complications, and even fatal outcomes for patients. Today, patients with multiple chronic diseases often receive prescriptions from different specialist physicians meanwhile and this increases the risk of dosage errors if proper care is not taken. In this work, we particularly focus on hypertensive patients with Type-2 Diabetes Mellitus (T2DM) and Chronic Kidney Disease (CKD) since these two diseases are common and related to each other. We proposed a novel fuzzy rule-based system that uses Glomerular Filtration Rate (GFR) values of patients to accurately model CKD stages of patients with uncertainty. In the proposed system, first we received expert opinion from three independent physicians regarding to drugs and drug doses in hypertensive patients depending on their CKD stages; (a) 18 drugs for T2DM treatment and (b) 66 drugs for CKD treatment. Subsequently, depending on fuzzified input GFR value of patients and fuzzy rules are designed based on the expert knowledge on drug doses. The proposed system, generates a total of 504 drug dose values for both diseases. Finally, drug doses for individual patients are estimated for the treatment of both T2DM and CKD. To the best of our knowledge, none of the previous works use a fuzzy system to arrange drug doses for hypertensive patients with T2DM and CKD, and this is the contribution of the proposed work.