

International Conference on **Medical Physics** August 03-05, 2015 Birmingham, UK

Mathematics physical assessment of cardiac dynamics based on theory of probability and proportions of entropy in the intensive care unit for patients with arrhythmia

Javier Rodríguez, Signed Prieto, Catalina Correa, Jairo Bautista, Alejandro Velasco, Laura Méndez, Hebert Bernal, Natalia Hoyos, Daniela Suarez and Fredy López
Universidad Militar Nueva Granada, Colombia

Previously, two methodologies for predictive diagnostic of holter was developed, one of which is based on probability distributions of heart rate (HR) ranges of 5 beats/min and beat ranges of 250 beats; and the other is based on entropy proportions of apparition frequencies of ranges of ordered pairs of HR. These methodologies have allowed the quantitative evaluation of cardiac dynamic, differentiated normality of illness and quantifying the evolution. These methodologies were applied here to 10 normal cardiac dynamics and 60 of ICCU patients with arrhythmia. The HR and the total beats per hour values obtained from holter were taken. Through these values, numerical attractors for each dynamic were built, and also the probability distributions on ranges of HR and beats were calculated; non equiprobable entropy and its proportions were calculated too and the evaluative parameters of both methodologies were applied. Later, the mathematic evaluation was compared in respect with Gold Standard and sensibility, specificity and Kappa coefficient were calculated. The normal cases had values into the expected limits for both methodologies. For the remaining cases, the values of the proportions H/Th were between 0 and 2.3586; Tn/H between 0 and 2.1087; Th/T between 0 and 1.9602; H/T between 0 and 0.5714; Tn/T were between 0 and 0.607 and U/T were between 0 and 0.151. Also the probability distributions presented ranges number between 7 and 12 and probability maximum of 0.374. The values of sensibility and specificity of the both methodologies compared with the conventional diagnosis were 100% and the Kappa coefficient value was 1. Both methods differentiate successfully normal from disease of holter recordings diagnosed with arrhythmia, and their level of evolution, confirmed the clinical applicability of the two methods of aid diagnostic.

Biography

Dr. Javier Rodríguez is a doctor at the Universidad Nacional de Colombia, founder and director of Insight Group, created in 2001. He has 76 domestic and international original publications, making characterizations, diagnoses and predictions in different areas of medicine, such as fetal and adult cardiology, infectious diseases, immunology, molecular biology, epidemic prediction, cell morphometry and psychology, as well as works in physics.

His research is based on the development of predictions from theories and laws of theoretical physics, applicable to each particular case, avoiding the empirical method of trial and error. It has been awarded as one of the 2000 most outstanding researchers century, one of the "Top 100 Health Professionals" and "Man of the Year 2011" by the International Biographical Centre of Cambridge. In 2010 he was awarded in the concourse of Academia Nacional De Medicina-Abbott in the area of Clinical Sciences by a mathematical-physicist diagnostic of cardiac dynamics, with which is possible to make predictions of clinical application.

His work has been presented at several international conferences, including the 7th International Meeting of Acute Cardiac Care, 2011, the Innovations in Cardiovascular Interventions - ICI meeting-2012 and the 61st Annual Conference of the Israel Heart Society in 2014, held at the Aviv Israel and the 3rd World Congress on Cancer Science & Therapy - 2013, held in San Francisco. Currently he is a doctor seconded to the Country Clinic and is conducting research with Universidad del Bosque, such as the present presentation.

grupoinsight2025@yahoo.es

Notes: