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15 year trend in ICD utilization according to the Italian national administrative database: an analysis of age groups

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To achieve a complete coverage of all Implantable Cardioverter Defibrillator (ICD) performed in Italy between 2001 and 2015, data from the National Hospital Discharge Database (SDO: "Scheda di Dimissione Ospedaliera") were analyzed. Frequencies and implant rate of ICD and Cardiac Resynchronization Therapy/Defibrillator (CRTD) according to the Italian population were computed. Data were analyzed for the following age classes: <50, 50–80, >80.

Results: Total number of ICD increased from 3141 in 2001 (implant rate 54/million inhabitants) to 23.540 in 2015 (387/million). From 2009 to 2015 CRT-D increased from 2916 in 2009 (49/million) to 8245 in 2015 (136/million), while the proportion of CRT/total ICD from 17% to 35%.

Mean age (from 67±12 in 2001 to 68±12 in 2015) and the proportion of males (from 80% to 79%) remained unchanged.

Ischemic heart disease was the most frequent diagnosis (55.6% in 2001, 45.4% in 2015).

ICD for secondary prevention have been reducing from 55.6% to 13.6% (ventricular tachycardia, VT) and from 18.1% to 5.9% (ventricular fibrillation, VF). The proportion of patients with heart failure (from 23.9% to 47.9%), hypertension (from 11.2% to 16.2%), diabetes mellitus (6.5% to 11.6%) and renal insufficiency (from 4.4% to 8%) increased.

The proportion of CRT/ICD remained constant (except for the 2009, where a possible underdiagnosis is very likely), between 43% and 39%.

In patients <50 years old the number of ICD increased from 367 (10/million) in 2001 to 1829 (52/million) in 2015; the most frequent diagnosis was idiopathic cardiomyopathy (30%), while ischemic heart disease was present in 20%. An increase of the proportion of patients with the diagnosis of heart failure (from 13.8% to 33.6%), hypertension (from 4.3% to 8.5%), diabetes mellitus (1.5% to 3.9%) and renal insufficiency (from 1.3% to 2.2%) was observed.

In patients >80 years old the number of ICD increased from 195 (82/million) in 2001 to 3902 (981/million) in 2015; ischemic heart disease was the most frequent diagnosis (53.8% in 2001, 43.5% in 2015). ICD for secondary prevention reduced from 50.3% to 14.8% (VT) and from 16.4% to 4.1% (VF), with an increase of the proportion of patients with heart failure (from 22.6% to 46.3%), hypertension (from 11.8% to 17.1%), diabetes mellitus (5.6% to 9.9%) and renal insufficiency (from 7.2% to 12.1%).

Conclusions: There was a steady increase of ICD and CRTD implantation during the last fifteen years, especially in those >80 years; the proportion of patients treated for secondary prevention dramatically reduced since early 2000; an increase of co-morbidities was observed.