

Incidence and Risk Factors of Sudden Cardiac Death in End Stage Renal Disease Patients undergoing Haemodialysis: A Retrospective Study

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Abstract:

Background: End Stage Renal Disease (ESRD) patients undergoing long-term haemodialysis are at increased risk of suffering from Sudden Cardiac Death (SCD). ESRD patients on haemodialysis are distinctively vulnerable to SCD owing to periodic fluid and electrolyte imbalances, uremic environment and foregoing cardiovascular injury. The present study was sought to evaluate the magnitude of incidence and risk factors of SCD in ESRD patients on haemodialysis in Pakistani population.

Material and Methods: A retrospective research study was undertaken at tertiary care hospital in Karachi, Pakistan from May 2016 to April 2019. The study recruited 202 eligible ESRD patients undergoing long-term haemodialysis. Baseline characteristics of the study participants with and without Sudden Cardiac Arrest (SCA) were recorded using self-reported questionnaires. Brief history was documented for comorbid such as Diabetes Mellitus (DM), Hypertension (HTN) and family history of cardiac disease. SCA and SCD events were identified by reviewing medical records and death certificates.

Results: The study recruited 261 patients during the study duration; however, on the basis of exclusion criteria 59 patients were ruled out. Out of 202 patients enrolled in the final analysis, 37 (18.3%) patients suffered from the episode of SCA. Of those 37 patients, 18 (48.6%) of the subjects were succumbed to death. ESRD patients who endured SCA were statistically older in comparison with their non-SCA counterparts (58.2 ± 11.4 vs. 52.3 ± 9.3 years, $P < 0.001$). When compared for comorbidities, HTN (67.6% versus 64.8%, $P = 0.001$), DM (62.2% versus 59.4%, $P = 0.004$), CAD (45.9% versus 41.8%, $P = 0.001$) and Congestive Heart Failure (CHF) (35.1% versus 34.5%, $P = 0.002$) were significantly prevalent in ESRD cohort with SCA in contrast to non-SCA. We also found LVH (62.2% versus 48.5%, $P < 0.001$), ventricular tachycardia (51.4% versus 30.9%, $P < 0.001$) and ventricular fibrillation/flutter (56.8% versus 25.5%, $P < 0.001$) to be statistically higher in ESRD patients on haemodialysis with SCA event. Through multivariate logistic regression analysis, we evidenced hypokalemia (OR = 1.247, CI 1.214 – 1.278, $P < 0.001$); CAD (OR 1.886, CI 1.469 – 2.342, $P < 0.001$); LVH (OR 1.861, CI 1.392 – 1.953, $P < 0.001$); ventricular tachycardia (OR = 1.253, CI 1.012 – 1.386, $P < 0.001$); and ventricular fibrillation/flutter (OR = 0.547, CI 0.518 – 0.773, $P < 0.001$) significantly and independently associated with SCD in ESRD patients on haemodialysis.

Conclusion: In conclusion, the prevalence of SCD among ESRD patients on haemodialysis with SCA episode is very high. CAD and ventricular tachyarrhythmias were statistically significant among ESRD patients on haemodialysis with SCA in comparison with non-SCA and were independently associated with the prevalence of in-patient SCD among ESRD patients with SCA on haemodialysis.

Keywords: End Stage Renal Disease; Haemodialysis; Sudden Cardiac Arrest; Sudden Cardiac Death