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In-hospital cardiovascular mortality in diabetic foot patients

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Dear Editor,

Diabetic foot (DF) is a term for foot problems in patients with diabetes mellitus arising consequential to arterial abnormalities and diabetic neuropathy. Longitudinal studies are shown to have associated cardiovascular mortality (CVM) with DF.¹ This retrospective analysis was aimed at investigating the occurrence of in-hospital CVM and cardiovascular events (CVE) among diabetic patients during their hospital stay for treatment of DF at a tertiary care setting in South India. Ethical approval was sought from the institutional review board. Case files of the admitted patients primarily for the treatment of current DF problems during the year 2009 were studied. Data concerning pre-existing cardiovascular disease (CVD), CVD risk factors, renal impairment, ulcer type, ulcer management, hypoglycaemic episodes, cardiovascular events, mortality and the treatment history, were recorded. If the diagnosis was not found documented clinical/laboratory measures and/or the medication history were considered to arrive at a diagnosis. The cause of mortality was copied from the death certificates attached with the case files.

Table 1 depicts the relevant data of 20 patients of type 2 diabetes mellitus (T2DM) with DF that were studied. All patients on admission were prescribed regular insulin and premixed regular (30%) + lente (70%) insulin injections. Ischaemic ulcers were treated with cilastazol. The ulcers were either managed conservatively (12/20) or surgically (8/20 – wound debridement, amputation of the toe and skin grafting) as needed. Two cases previously treated with oral anti-diabetic drugs (OAD) developed hypoglycaemia (random blood glucose levels – 33mg/dL and 50mg/dL, respectively) following treatment with insulin, necessitating medical assistance.

In-hospital mortality was 10% (2/20) and silent myocardial infarction (MI) was recorded as the cause of death in both cases. Both had no pre-existing ischemic heart disease (IHD), dyslipidemia, nephropathy or cardiac autonomic neuropathy with one patient effectively being treated with drugs for previous high blood pressure. Mortality occurred on the 12th and 27th days of the hospital admissions, respectively. Both had uncontrolled glycaemic levels with OAD prior to hospital admission with one experiencing a hypoglycaemic event three weeks prior to death. Both cases had an ulcer of < one month duration, one neuropathic and the other neuro-ischaemic. There was no mention or indication for the occurrence of other CVE in the case files.

Table 1: Patient characteristics

Variables	N=20
Age (mean ±SD)	60.80±7.11
Median duration of diabetes mellitus	8 years (4-17years)
Median duration of diabetic foot at hospital admission	8 days (5-30days)
Median duration of hospital stay	8 days (3-45 days)
Male : female	11:9
Hypertension	10 (50)
Dyslipidemia	5 (25)
Ischaemic heart disease	5 (25)
Nephropathy/ renal impairment	0 (0)
Neuropathic ulcer	20 (100)
Neuro-ischaemic ulcer	10 (50)
Prior insulin treatment	5 (25)

Data is mean ±SD, median, or n (%)

High mortality associated with DF is no longer attributed to ulcer-related outcomes alone. Follow-up studies have related the increased deaths in DF patients with CVD events. IHD itself was considered as the largest single cause of death among DF patients and the mortality cases were more likely to have pre-existing CVD.¹



DF ulceration reflects the established arterial disease elsewhere, hence, adoption of aggressive cardiovascular risk management has been recommended for all DF patients.¹ In the current analysis that concentrated on reporting in-hospital CVD-related mortality and morbidity in DF patients, appropriate medications were prescribed to treat pre-existing IHD (25%), dyslipidemia (25%), and hypertension (50%) prior to the current hospital admissions. The attribution of such therapy in having conferred protection from CVE and CVD-related mortality in these patients cannot be exclusively denied. Also, it is noteworthy that both of the patients who supposedly died of MI did not have pre-existing IHD or dyslipidemia thus nurturing the importance of treating CVD risk factors in all DF patients. As the mortality was exclusively attributed to cardiovascular events, the present study findings underline the importance of close monitoring of patients presenting with DF concerning their CVD status and CVD outcomes during their hospital stay. Hypoglycaemia was recorded as an earlier event in one of the mortality cases and its contribution to the causality of coronary event in this case cannot be excluded as in a follow-up study intensive glucose lowering in high-risk T2DM patients was associated with significantly higher rates of hypoglycaemia and mortality.² A meta-analysis report concludes that tight glycaemic control in a broad spectrum of critically ill adult patients was not associated with a significant reduction in hospital mortality but was associated with a markedly increased risk of hypoglycaemia, suggesting a need for a re-evaluation of the guidelines recommending tight glucose control in all critically ill patients.³ It is crucial to note that currently there is no recommendation specifying a safe glycaemic target that needs to be achieved while treating DF patients in the intensive care setting (ICS), which demands serious thought. This preliminary report, although, flawed by a small sample size, may help to draw clinicians' attention to exercise caution during glycaemic management of DF patients in ICS until large clinical trial data emerges to set out standard glycaemic goals in DF management.

Sincerely,

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