The Impact of Diabetes on Hospital Length of Stay, Cost, and Inpatient Mortality Following Open Reduction and Internal Fixation of Ankle Fractures: An Argument for Increased Hospital Reimbursement

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Purpose: This study was conducted to evaluate the impact of diabetes on the cost, length of stay, and inpatient mortality following open reduction and internal fixation (ORIF) of the ankle.

Methods: The New York Statewide Planning and Research Cooperative System (SPARCS) database, which includes all admissions to New York State hospitals from 2000-2011, was queried for all patients who underwent the primary procedure of ORIF of an ankle fracture. We identified all patients with diabetes mellitus (DM) and a subgroup of these patients with complicated diabetes mellitus (C-DM). The control group was patients without diabetes mellitus (–DM). Inpatient length of stay, total hospital cost, inpatient mortality, and Charlson Comorbidity Index (CCI) were compared between –DM and DM and between DM and C-DM.

Results: From 2000-2011, 58,748 patients underwent ORIF of an ankle fracture, of whom 7501 (12.8%) had DM. The DM cohort was significantly older than the –DM cohort (62.5 ± 13.7 years vs. 46.6 ± 19.1 years, $P < 0.01$). Mean length of stay and total hospital charges were significantly greater for the DM cohort compared to the –DM cohort (5.8 ± 6.1 days vs. 3.9 ± 4.7 days, $P < 0.01$; $26,492 ± $26,405.74 vs. $20,428.51 ± $23,946.69, $P < 0.01$). The CCI scores were significantly higher for the DM cohort compared to the –DM cohort ($P < 0.01$), which was associated with a greater inpatient mortality rate in the DM cohort compared to the –DM cohort (0.3%, 25/7501 vs. 0.1%, 46/51,247, $P < 0.01$). Of the diabetic patients, there were 1098 patients (15%) with C-DM and there was no significant difference in age ($P = 0.178$) or gender ($P = 0.541$) between the DM and C-DM cohorts. The mean length of stay and total hospital costs for the C-DM cohort were 2.4 days longer and $6895 more costly for the C-DM cohort compared to the DM cohort, respectively (both $P < 0.01$). The CCI scores were significantly higher for the C-DM cohort ($P < 0.01$), which was associated with a greater inpatient mortality rate in the C-DM cohort compared to the DM cohort (0.7%, 8/1098 vs. 0.3%, 17/6403, $P = 0.02$).

Conclusion: Diabetic patients undergoing ORIF of ankle fractures have significantly longer lengths of stay and incur significantly higher hospital charges when compared to those without diabetes. As patients with diabetes develop complicated diabetes, they have worsening medical comorbidities and this significantly increases their inpatient mortality risk (although overall risk remains minimal). As recent government regulations require physicians to certify estimated length of stay for hospital inpatient admissions for Medicare and Medicaid patients, these data provides useful information for physicians to more accurately estimate hospitalization for diabetics undergoing ORIF of ankle fractures. Increased hospitalization time is a factor linked to increased cost of treating diabetic ankle fractures and is associated with the increased number of comorbidities that require inpatient management. This data can be used to argue for increased hospital reimbursements for diabetics and complicated diabetics undergoing ORIF of ankle fractures.

See pages 99 - 147 for financial disclosure information.