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The Impact of Co-morbidities on a 6-year Survival after Methanol Mass Poisoning Outbreak

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OBJECTIVE: To study the impact of burden of co-morbidities and methanol-induced brain lesions on hospital, follow-up, and total mortality.

METHODS: All patients hospitalized with methanol poisoning during a mass poisoning outbreak were followed in a prospective cohort study until death or final follow-up after 6 years. The age-adjusted Charlson co-morbidity index (ACCI) score was calculated for each patient. A multivariate Cox regression model was used to calculate the adjusted hazards ratio (HR) for death. The survival was modeled using the Kaplan–Meier method.

RESULTS: Of 108 patients (mean age with SD 50.9 ± 2.6 years), 24 (54.4 ± 5.9 years) died during hospitalization (mean survival with SD 8 ± 4 days) and 84 (49.9 ± 3.0 years; p = 0.159) were discharged. Of the discharged patients, 15 (56.3 ± 6.8 years) died during the follow-up (mean survival 37 ± 11 months) and 69 (48.5 ± 3.3 years; p = 0.044) survived. The hospital mortality was 22%, the follow-up mortality was 18%; the total mortality was 36%. Cardiac/respiratory arrest, acute respiratory failure, multiorgan failure syndrome increased the HR for hospital and total (but not follow-up) mortality after adjustment for age, sex, and arterial pH (all p <0.05). All patients who died in the hospital had at least one complication. A higher ACCI score was associated with greater total mortality (HR 1.22; 1.00–1.48 95% CI; p = 0.046). Of those who died, 35 (90%) had a moderate-to-high ACCI. Patients with a high ACCI had greater follow-up mortality compared to ones with low (p = 0.027) or moderate (p = 0.020) scores. For the patients who died during follow-up, cancers were responsible for 47% of the deaths.

CONCLUSIONS: The character and number of complications affected hospital but not follow-up mortality, while the burden of co-morbidities affected follow-up mortality. Relatively high cancer mortality rate may be associated with acute exposure to metabolic formaldehyde produced by methanol oxidation.