

Chapter 11 Complications & Outcomes

Mortality

Outcomes: Hospitalization – Emergency Room Admissions - Cardiac Events

Morbidity: PVD, Hepatitis, Sleep Apnea, Hypotension, Bleeding, depression, restless leg syndrome

The patient population undergoing HD arrives into end stage of renal disease burdened with a number of major pathologies: Loss of kidney function, anemia, mineral and molecular imbalance, metabolic disorders and acidosis, and a mosaic of comorbidity (diabetes, hypertension, cardiac disease ... etc.). While on maintenance HD, patients may additionally be imperiled by several insults:

- Exposure of patients' blood to artificial surfaces & solutions causing chronic sensitization
- Progression of major comorbidities and/or emergence of their complications
- Vascular access failures, complications and infections
- Missteps in the complicated multi-dimensional clinical management of patients

Mortality (Ref. table 4.1)

The date a patient died was captured in this registry module. The place and cause of death were not requested as it was impossible to verify that information with the available resources. The death was not confirmed against the national mortality records as those were also plagued with their own shortfalls. This additional information will be gradually incorporated into the registry as it matures into future versions.

Crude or adjusted mortality rates were not computed since only 2/3 of units completed monthly updates where date of death was entered, and among those, the registry team had doubts about completeness of death entries. Hence, in this report, we will cover only descriptive information about the 157 documented deaths among the 1938 eligible patients analyzed.

Patients who died were 66.7 ± 13.8 years old (median = 70, range: 24 to 95 years). The distribution of these deaths by patient category and region are shown in **table 11.2**. These patients survived on average 56.7 ± 58.5 months after onset of HD (median = 37, range: 0.5 to 267 months).

Table 11.2 Distribution of reported mortality by patient category and region

Patient Category	# Eligible (Denominator)	# Deaths (%)	Age at Mortality (Years)			Survival on Dialysis (Months)		
			Mean \pm SD	Med	Range	Mean \pm SD	Med	Range
All Deaths	1938	157 (8.1)	66.7 \pm 13.8	70	24 - 95	56.5 \pm 58.5	37	0.5 - 267
Incident*	539	38 (7.1)	67.4 \pm 14.4	69	24 - 88	5.8 \pm 4	5	0.5 - 16
Prevalent	1399	119 (8.5)	66.6 \pm 13.5	70	32 - 95	72.1 \pm 59	48	11.2 - 267
Beirut	143	9 (6.3)	68.2 \pm 11	70	41 - 80	103 \pm 67	86	27.1 - 201
Bekaa	228	13 (5.7)	63.5 \pm 11.8	67	35 - 76	28 \pm 14	27	7.7 - 57
Mt Lebanon	568	38 (6.7)	69.4 \pm 13.4	74	37 - 95	44 \pm 46	26	0.5 - 174
North	576	42 (7.3)	66.6 \pm 13.3	70	35 - 89	76 \pm 77	45	1.2 - 267
South	423	55 (13)	65.4 \pm 15.1	68	24 - 90	49 \pm 47	40	0.8 - 208

❖ Incident (recent starters): Patients who started HD between November 1, 2010 and June 2, 2012

About 59% of reported deaths were diabetic, while the proportion of diabetics among all HD patients in Lebanon was 45.9% (see chapter 10), making the odds of death among diabetic HD patients 1.44 times higher than non-diabetics.

The reported 157 deaths included 10 (6.4%) which occurred during the first 3 months on dialysis and 34 (21.7%) which occurred during the first 12 months on dialysis. Of the remaining 123 deaths, 74 (47.1%) occurred in patients who survived 1-5 years on dialysis and 49 (31.2%) occurred in patients who survived more than 5 years on dialysis.

Clinical Outcomes (Ref. tables 11.1)

Three key clinical outcome parameters were captured in the NKR: hospitalization, emergency room (ER) admissions and cardiovascular events (CVE). The registry team felt confident in the hospitalization reporting, while ER admissions and CVE's appear to be under-reported. However, analysis of what was reported in ER admissions and CVEs provided valuable outcomes information.

Hospitalization: When a hospitalization occurred, start date was documented in the corresponding monthly update record along with duration, diagnosis and procedure(s) done. Occurrence of hospitalization and length of stay were well reported, while diagnosis and procedures reporting was partial. In order to exclude transitory hospital admissions dedicated to simple vascular access repairs, same day durations were excluded.

Overall, 29.7% of patients were hospitalized at least once during the one year of eligibility. A higher proportion of patients who recently started HD was hospitalized (34.6%) compared to earlier starters (27.8%). Regional differences were pronounced with a high of 44.7% of patients in Beirut and a low of 14.6% of patients in Beqaa were hospitalized. Of the patients who were hospitalized, 13% were admitted only once, 7.6% were admitted twice and 8.8% were admitted 3 or more times during the one year of reporting. A higher proportion of incident patients were admitted once or twice during the year, while a slightly higher proportion of prevalent patients were admitted ≥ 3 times during the year.

A small proportion of admitted patients (13.7%) were hospitalized for only one day (including one night), while 45.4% were hospitalized for 2-3 days, 27.2% of admissions were for 4-7 days and 13.7% were for > 7 days. The mean length of hospital stay was 5.4 ± 5.9 days (median = 3 days). Length of hospital stay was higher in Beirut and Mount Lebanon (Mean = 9.7 and 7.3 days, median = 7 and 4 days, respectively), compared to Bekaa, North and South (Mean = 3.9, 4 and 4.7 days respectively and median = 3 days for all 3 regions).

Reported diagnoses were classified into body systems. The 161 hospitalization events with reported diagnosis were distributed into "General Medical" (42), "Respiratory" (30), "Cardiac" (26), "Renal Complications" and "Gastrointestinal" with 14 admissions each. Of the remaining 35 admissions, there were 7 or less admissions due to "Vascular Access Complication", "Infection", "Bone and Joints", "General Surgery", "Head and Neck", "Nervous System" and "Transplant".

Emergency Room (ER) Admissions: Date of ER admission, duration of ER stays in hours, reason for admission and destination after discharge were recorded. Only 7.3% of patients had at least one ER admission during the reporting year with an average stay of 4.3 ± 5.3 hours (median = 3 hours). Of those

patients who had ER admission, 4.6% had one admission, 1.5% was admitted twice and 1.2% was admitted 3 or more times. The majority of ER stays were 10 hours or less (89%) and only 9.1% extended > 24 hours.

Destination of patient following ER was reported in 148 events, with 54.7% admitted to hospital, 30.4% treated and discharged, 4.1% referred to OP doctor and 10.8% were reported as “Other” (includes mortality in the ER).

Cardiovascular Events (CVE): Only 109 patients (7.3%) were reported as having at least one CVE during the one reporting year, where 95 of them had only one event and 14 had 2 or more CVEs. The 131 reported events were distributed into “Angina” (38), “Coronary Artery Blockade” (31), “Cardiac Arrest” (24), “Heart Failure” (13) and “Peripheral Vascular Disease” (8) and “Other” (17).

Complications

A number of emergent complications commonly occurring in patients on HD were recorded in the registry as part of the monthly updates on a Y/N basis. All those complication are of chronic nature, as their diagnosis reflects a predisposition to their repeated occurrence in the future. A single occurrence includes a patient in the numerator count. Several of these complications are prone to periods of remission and exacerbations; hence theoretically, a patient may have multiple events reported in the monthly updates reflecting occurrence of acute exacerbations. However, it may take few years of reporting quality improvement before it is accurately recorded. The frequency of these complications as a patient and event counts and proportion of total is presented in **table 11.3**.

Table 11.3 Emergent complications frequency count of patients and events and % of total*

Complication	# Patients (%)	# Events (%)
Peripheral Vascular Disease	346 (21.2).	936 (9.7)
Hepatitis B or C	183 (11)	586 (6.1)
Sleep Apnea	116 (6.9)	136 (1.4)
Protracted Hypotension	477 (29.3)	1136 (11.7)
Bleeding	25 (1.5)	36 (0.4)
Depression	258 (15.9)	556 (5.8)
Restless Leg Syndrome	304 (18.5)	572 (5.9)
Chronic Obstruction Pulmonary Disease	199 (12.2)	301 (3.1)

❖ Total: Patients or events (pat-months) after excluding records left blank for a given parameter.