Chapter 6 Hemodialysis Parameters

Dialysis Session – Vascular Access - Adequacy

Dialysis sessions are a vital part of HD patients' lives, which keeps them thriving: 3 times a week for several hours each time, adding up to about 40 full days a year spent on related functions. A critical component of this course is inserting and maintaining a healthy and functioning vascular access. One helpful factor to that end is using an arteriovenous fistula (AVF) in the majority of HD patients. ***In Lebanon: they do.***

Dialysis Sessions (Ref. table 6.1)

The MOPH default allowance used to be for two HD sessions a week and a 3rd session will have to be justified during the period captured in this report. That has changed to a 3 sessions in 2013. Yet, during the reporting period, 77.2% of patients underwent dialysis 3 times a week. The proportion of HD patients who have only two weekly sessions is higher in larger regions with lower density of HD units: South (30.9%), North (22.1%) and Bekaa (19.8%). Urban areas which have a high density of HD units have lower proportions of twice-weekly sessions: Beirut (11.2%) and Mount Lebanon (15%). Only few patients had 4 or more session, mostly in Beirut area.

Dialysis sessions were conducted for an average duration of about 4 hours and adding up for a mean total weekly of 11 hours (median=12). Minimum total weekly hours were 3 and maximum was 20.

Time on Dialysis (Ref. table 6.1)

On the cutoff date of June 2nd, 2012; about 31% of patients have started dialysis during the prior 12 months while 45% have been on dialysis for over 3 years. Mean time on dialysis was 58.6 ± 61.3 (median=38) months. There were differences between regions (**figure 6.1**) with the longest mean duration in North (76 months) and shortest in Beqaa and Mount Lebanon (45 & 46 months respectively). Mean length of time on dialysis was larger than the median, skewed by few patients who had been on dialysis for over 20 years (**figure 6.2**).

Figure 6.1 Distribution of HD patients in Lebanon by how long on dialysis by region

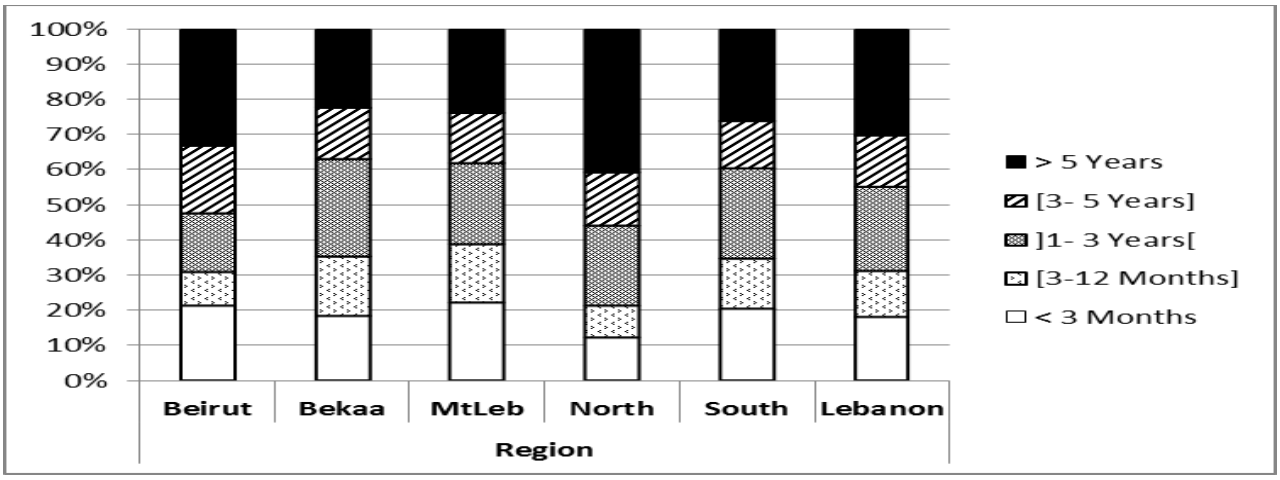
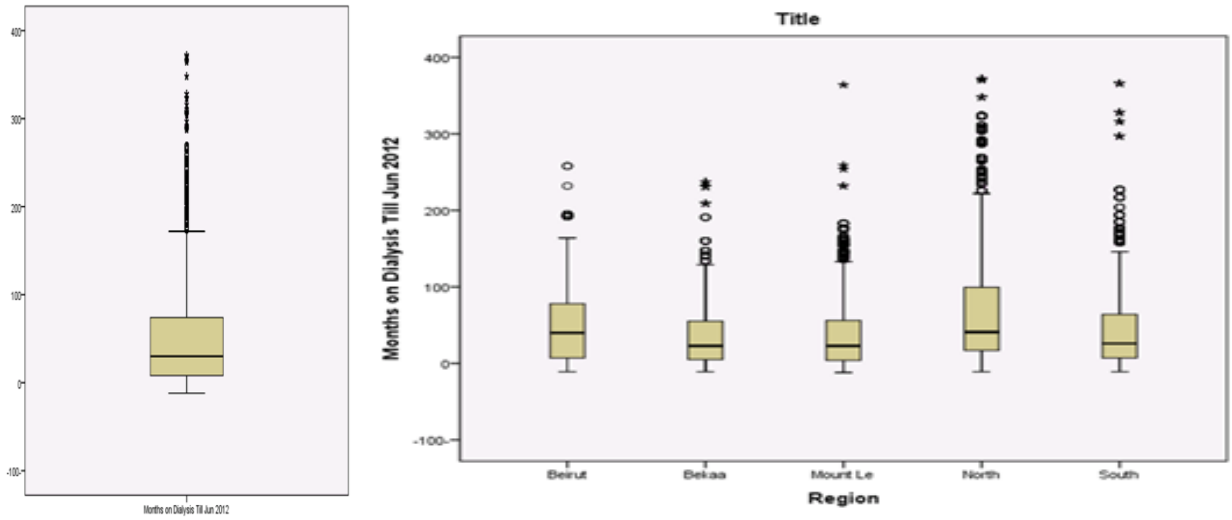


Figure 6.2 Distribution of patients by how long on dialysis, overall and by region



Vascular Access (Ref. table 6.1)

A major advantage for patients on maintenance HD in Lebanon is that most of them (78.6% of patient-months) dialyze via an AVF. There were differences between regions with the highest proportion of patient-months dialyzing using AVFs was in Beirut (89.4%) and the lowest in Mount Lebanon (67.7%) and Beqaa (68.9%). The remaining proportion of patient-months was dialyzed using a graft (2.4%), a permanent catheter (4.5%) or a temporary catheter (5.5%). Data was missing in the remaining 9.1% of patient-months.

Anti-Coagulants: Most HD patients received anticoagulant during their sessions (84% of patient-months) with differences between regions: a low of 71.9% of patient-months in Beqaa and a high of 97.5% and 96.8% of patient-months in Beirut and South respectively. Most patients received conventional heparin (61.9% of patient-months) while low molecular weight heparin was given in 17.1% of patient-months.

Anti-vitamin K was not used. The type was not defined in 20.9% of patient-months. Differences between regions were considerable (Ref. table 6.1).

Vascular Access Complications (Ref. table 6.2)

There were reported vascular access complications in 3.4% of dialysis patient-months. Most frequent complication was thrombosis / embolism (36.4% of events) followed by stenosis at 24.6% (**figure 6.3**). Infection (13.8%), cannulation problems (11.6%), hemorrhage (2.4%) and recirculation (1.8%) were also reported. Type of complication was not specified in 9.4% of events.

As a result of these complications, patients returned to using the original access in only 33.8% of events, with a wide range of 20% to 41.7% returning to original access in different regions. The type of repair done was not specified in 35.7% of events. Of the reported repairs (**figure 6.4**), the most common type was surgical (51.5% of events) followed by outright replacement (32.1%), thrombolysis (5.1%), stenting (3.4%) and other (7.8%).

Figure 6.3 Distribution of patients by type of observed vascular access complications

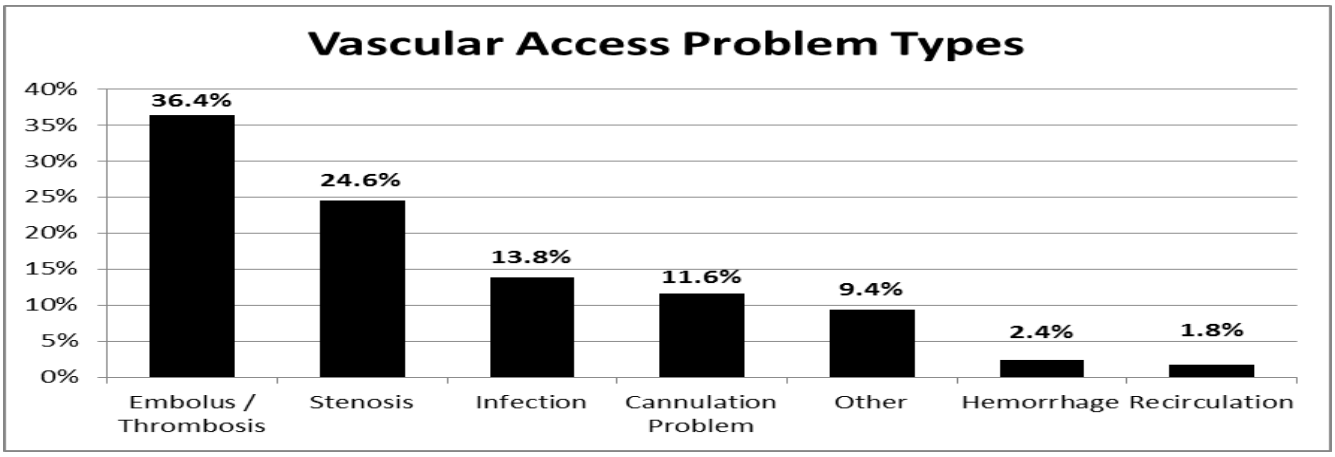
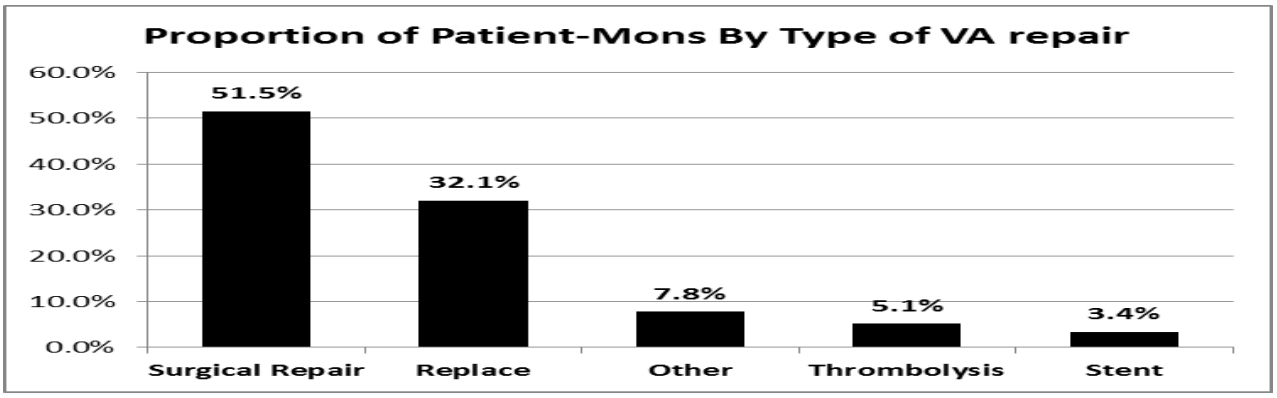


Figure 6.4 Distribution of patients by type of observed vascular access repairs done



Over 50% of repairs were done within one day and another 25% were done within a week. In about 10% of events, the repair took > 3 weeks. The alternative access mostly used while awaiting the repair, was a permanent catheter in 63% of these events.

Adequacy of Dialysis (Ref. table 6.3)

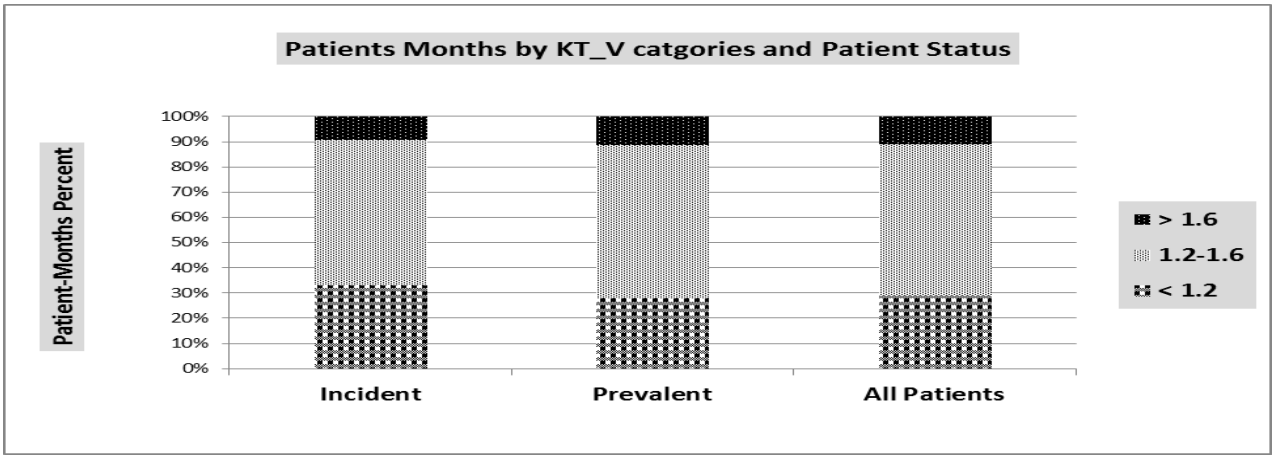
Urea reduction ratio (URR) will be used as the standard adequacy measure in this report as it is available for all patients in the registry. The registry software automatically computes URR. There is no requirement for Kt/V to be reported. Yet, it was documented by many centers, accounting for 71.2% of total patient-months. A wide variety of formulas were used to assess Kt/V.

Pre- and post-BUN were reported monthly in all patients. Average pre-dialysis BUN was 89.5 ± 58.5 (median = 77), slightly higher in recent starters (mean = 94, median = 79.7) compared to earlier starters (mean = 87.8, median = 76). There were considerable difference between regions with the highest in North and Beqaa (mean = 113.1 and 111.9, median = 128 and 101; respectively) and lowest in Mount Lebanon and South (mean = 72.3 and 75, median = 62 and 70; respectively). Average post-dialysis BUN was 29.4 ± 20.3 (median = 25), with no noticeable difference between recent and earlier starters. Regions that had highest pre-BUN also had highest post-BUN and similarly for the lowest.

The mean URR for all patients was 66.9% (median = 67.7) with little difference in recent vs. earlier HD starters or between regions of Lebanon, except in Beqaa where mean URR was 62.5% (median = 63). The proportion of patient-months with URR < 65% was 38.7% Lebanon-wide but was higher among recent starters at 44.6% of patient-months compared to 37% of earlier starters. The proportion was highest in Beqaa (57.6% of patient-months) and lowest in Beirut (30.5% of patient-months).

The mean Kt/V for all patients was 1.3 (median = 1.3) with little variation by patient type or region. Beqaa had lowest mean Kt/V at 1.2 (median = 1.2) while Beirut had highest at 1.4 (median = 1.5). About 60% of patient-months reported were in the 1.2 to 1.6 range (**figure 6.5**), while 29% were at levels < 1.2 and 10.9% were at levels > 1.6. Patients who started HD recently had higher proportion of Kt/V < 1.2 (33% of patient-months) compared to earlier starters (27.8% of patient-months).

Figure 6.5 Distribution of HD patients by Kt/V level and patient category



Interdialytic Weight Gain (Ref. table 6.3)

The average Interdialytic weight gain (IDWG) was reported as 2.6 ± 1.3 kg (median = 2.4), with little difference by patient category or region. The proportion of patients who had an excessive IDWG > 4 kg did not exceed 10% of total patient-months.

The dialysis parameters module in the registry can be used as a record of vascular access history and repair for a patient. Print the page and add it to the patient chart or simply adopt the registry as an electronic record.

Guidelines on vascular access creation, maintenance, repair and cannulation are available on the Registry website research page:

https://www.kidneyregistrylb.com/pages/research-program/research-projects/vascular-access-study/