

Erythropoiesis-Stimulating Agent Use is Increased Following Missed Dialysis Sessions

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Introduction

- Missed dialysis sessions can have detrimental effects on patient morbidity and mortality, and can increase the risk of hospitalization. 1-3
- In addition to missing dialysis itself, patients may fail to receive medications - such as erthyropoiesis-stimulating agents (ESAs) - that are commonly dosed at each session.
- Missed sessions can also have a direct impact on facility costs: Under the current Medicare bundled Prospective Payment System (PPS), introduced in 2011, the dialysis composite rate payment was expanded to cover the cost of injectable drugs (such as ESAs) and laboratory tests that were previously separately billable.4

Objective

We have carried out a retrospective database analysis of missed dialysis sessions among end-stage renal disease patients within a large dialysis organization in the US to assess ESA dose changes following missed session episodes.

Methods

- Data from adult (> 18 years old) hemodialysis patients receiving in-center dialysis ≥ 3 times/week between January 1, 2010 and December 31, 2010 were assessed.
- A missed session was defined as an expected dialysis session that the patient did not attend and did not make up.
- Expected: 3 sessions/week, 12-14 sessions/month depending on schedule and calendar month
- All missed sessions were included in the analysis (even if the patient was hospitalized).
- Missed session episodes were defined as sequences of consecutive missed sessions, each of which was ≥ 1 missed session in length.
- Average ESA doses in the periods before (14 or 30 days) and periods after (14 days, 30 days or days 31-60) a missed session episode were characterized and stratified by length of missed session episode. Differences in ESA utilization in the before and after periods were calculated.
- To determine overall ESA utilization, we assessed mean monthly total ESA dose by number of missed sessions in the month.

Results

- Data from 105,519 patients over 903,179 patient-months were analyzed. The mean number of attended sessions was 12.01 ± 2.24 (mean ± SD) per patient-month and the mean number of missed sessions was 1.05 ± 2.20 per patient-month (Table 1 and Figure 1)
- Per-session ESA dose was increased in the period following a missed session episode - increases ranged from 134-1,512 U/session comparing the 14 days pre/post missed session episode, from 1,835 - 4,093 U/session for the 30 day time period, and 63 - 2,778 U/session for the 31-60 day time period (Table 2).
- Longer missed session episodes were generally associated with greater dose increases in the post-missed session period. All dose increases were sustained over 60 days (Table 2).
- The analysis allowed additional missed sessions before/after the missed session episode. An analysis which excluded patients with additional missed sessions in either period showed similar results (data not shown).
- Total monthly ESA use was increased in months where patients missed up to 6 sessions, compared to months in which all sessions were attended, despite the fact that sessions at which ESA would normally be given were missed (Table 3).

Table 1. Summary Statistics: Missed Sessions

Overall Patient-Month	Mean ± SD	Percent
Attended sessions/patient-month Attended at home facility/patient-month Attended at other facility/patient-month	12.01 ± 2.24 11.95 ± 2.28 0.06 ± 0.44	91.99% 91.53% 0.45%
Missed sessions/patient-month Missed due to hospitalization	1.05 ± 2.20 0.41 ± 1.44	8.01% 3.14%

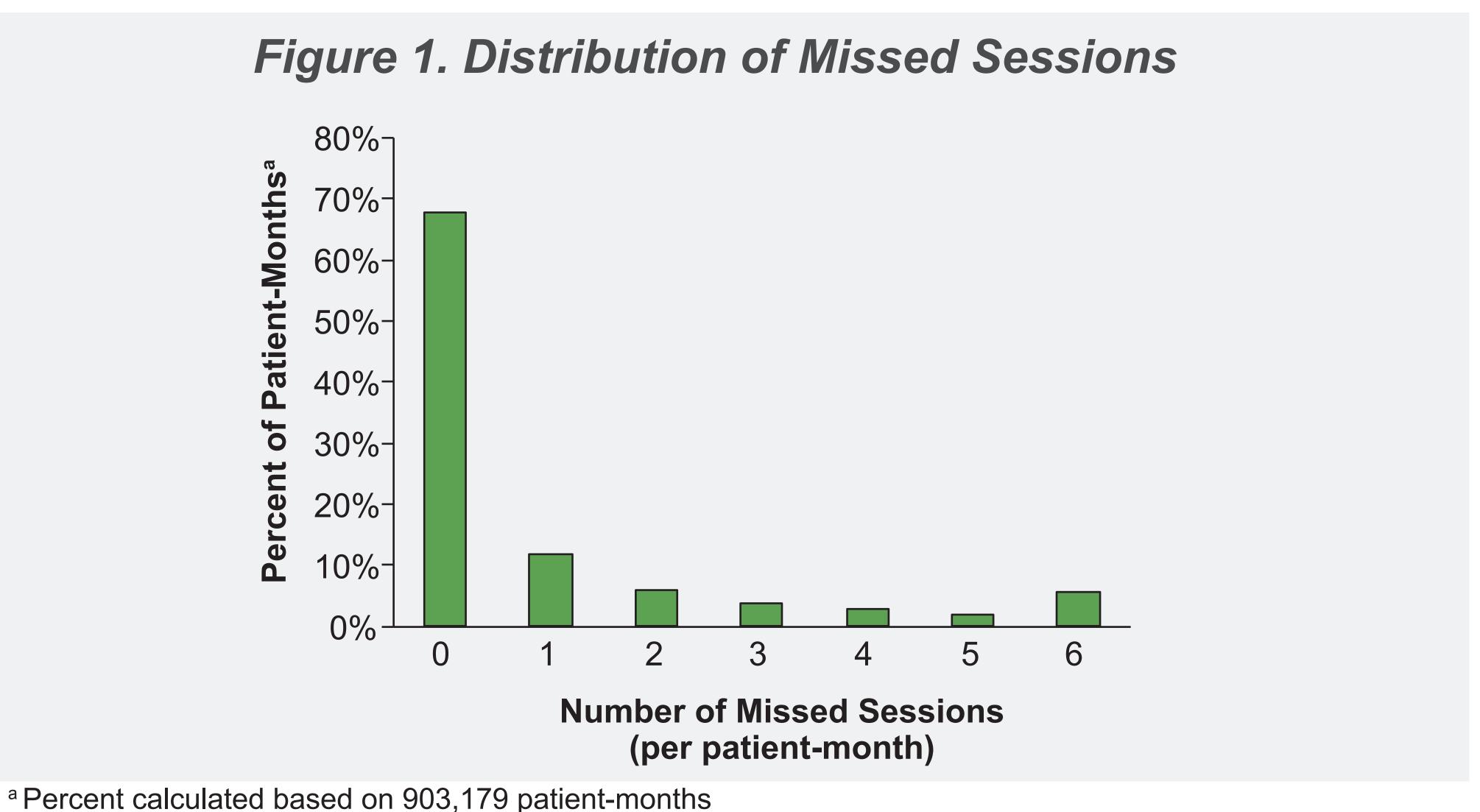


Table 2. Per-session ESA Dose Increases Following Missed Sessions

	Number of Missed Sessions	Change in ESA Dose (U)	N (Patient- Months)	P-value ^a
14 day	1	+ 134	278,294	<.0001
	2	+ 616	47,508	<.0001
	3	+ 898	21,180	<.0001
	4	+ 1,159	11,090	<.0001
	5	+ 1,158	6,601	<.0001
	6	+ 1,270	4,248	<.0001
	7	+ 1,461	2,835	<.0001
	8	+ 1,512	2,028	<.0001
30 day	1	+1,835	278,294	<.0001
	2	+ 2,693	47,508	<.0001
	3	+ 2,572	21,180	<.0001
	4	+ 3,145	11,090	<.0001
	5	+ 3,422	6,601	<.0001
	6	+ 3,754	4,248	<.0001
	7	+ 4,093	2,835	<.0001
	8	+ 3,631	2,028	<.0001
31 - 60 day	1	+ 63	240,177	0.0002
	2	+ 951	39,847	<.0001
	3	+ 1,501	17,872	<.0001
	4	+ 1,963	9,211	<.0001
	5	+ 2,168	5,428	<.0001
	6	+ 2,507	3,524	<.0001
	7	+ 2,778	2,286	<.0001
	8	+ 2,601	1,648	<.0001
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^a Given the large data set (over 900,000 patient-months), small changes in dose were statistically significant. However, the statistical test does not inform clinical relevance.

Table 3. Total Monthly ESA Dose is Increased Following Missed Sessions

Missed Sessions (per Patient-Month)	N (Patient-Months) ^a	Change in Total Monthly ESA Dose (U)
0	613,049	<u> </u>
1	105,093	+ 8,707
2	53,739	+ 14,130
3	32,358	+ 15,125
4	24,156	+ 9,122
5	16,191	+ 5,651
6	10,279	+ 1,803
7	7,218	- 7,797
8	5,796	- 17,281

^a Complete (non-discontinuation) months only

Conclusions

- Missed dialysis sessions resulted in substantial increases in ESA use when the patient returns to the clinic (1,835 - 4,093 U/session increase comparing the 30 days before and after a missed session episode).
- Longer missed session episodes were generally associated with greater increases in ESA use in the post-miss period.
- Dose increases following all missed session episodes were sustained over 60 days.
- For months in which patients missed up to 6 dialysis sessions, total monthly ESA doses were higher than for months in which patients attended every session.
- Increases in ESA use following missed sessions should therefore be considered in any assessment of the impact of missed sessions: both clinical and financial.

References

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