



Evaluating the Etiology of Falls in Hospitalized Patients Receiving Intravenous Antihypertensive Agents

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BACKGROUND

The use of antihypertensive medication in hospitalized patients is a common and necessary practice in hospitals to keep blood pressure at appropriate levels. A common issue in patients that have come into the hospital due to hypertensive issues is being given IV antihypertensive agents when they are not indicated, and/or being left on IV antihypertensive agents after blood pressure control has been achieved. Besides not following guideline recommendations on how to treat hypertension in the hospital setting this practice could be potentially dangerous and lead to falls resulting in harm and increased healthcare costs. While there is data regarding antihypertensive use and falls in elderly care facilities there is only a limited amount of data concerning IV antihypertensive use and falls in hospitalized patients. It is well studied that falls may account for almost 70% of accidents in hospitals and that up to 30% of these falls may lead to physical harm.¹ In countries such as the United States, Europe, and Australia 0.85 to 1.5% of health costs are related to the treatment of falls.² There are several classes of medications that can contribute to an increased risk of falling such as benzodiazepines, antidepressants, antipsychotics, antihypertensives, antiarrhythmics, and opioids.¹ A study by Shuto et al. demonstrated that antihypertensive medications were associated with a significantly increased risk of falls.¹ In this study the odds ratio for falls was twice as high for the antihypertensive group than the next highest odds ratio which was for antiparkinsonian medications.¹ When evaluating specific medication the use of candesartan was associated with an odds ratio that was twice as high as the next highest odds ratio in the all age group analysis.¹

OBJECTIVE

Determine if the number of patients who fell in the hospital receiving IV antihypertensive is greater than the number of patients that fell and were not receiving IV antihypertensive medications

METHODS

The institution prescribing records and fall report records from January 2018 to December 2019 were analyzed to determine the number of patients that fell and how many of those patients received IV antihypertensive medications.

The primary outcome compared total number of patients that fell while receiving IV antihypertensive medications with the number of patients that fell who did not receive IV antihypertensive medications.

Nominal data was compared using χ^2 statistical analysis
Non parametric continuous data used the median for measure of central tendency

RESULTS

From 2018-2019 855 admitted patients fell at UMC

Date	Patient falls	Fall and IVAH	%
1/1/2018-3/31/2018	92	17	18
4/1/2018-6/30/2018	82	16	20
7/1/2018-10/31/2019	101	21	21
11/1/2018-2/28/2019	106	28	26
3/1/2019-7/31/2019	129	24	19
8/1/2019-10/31/2019	64	7	11
11/1/2019-12/31/2019	43	10	23
Total	617	123	20

Date	Fall and IVAH	Injured and IVAH	%
1/1/2018-3/31/2018	17	2	12
4/1/2018-6/30/2018	15	3	20
7/1/2018-10/31/2019	20	4	20
11/1/2018-2/28/2019	16	2	13
3/1/2019-7/31/2019	31	7	23
8/1/2019-10/31/2019	15	2	13
11/1/2019-12/31/2019	10	2	20
Total	124	22	18

	Multiple falls		Total	
	N	Y		
IVAH				
N	61	23	84	27.4%
Y	37	2	39	5.1%
Total	98	25	123	P=0.0043

16 (73%) of 22 patients that fell and were injured received hydralazine

Median length of stay after multiple falls increased to 11 days from 4 days p=0.0014

Median BMI 27.12

BMI and fall injury					
Fall Injury	Min	1Q	Median	3Q	Max
N	17.6	22.1	26.6	32.7	55.5
Y	19.82	25.2	32.4	37.3	50.31
P=0.0187					

The most common contributing medication was an antihypertensive

BMI and multiple falls					
Multiple Falls	Min	1Q	Median	3Q	Max
N	17.6	23.7	28.1	35.4	55.5
Y	19	22	22.6	27.3	32.72
P=0.0027					

Mean age 59.5 years

99% of patients had a contributing medication

CONCLUSIONS

1. Roughly 20% of patient that fell were receiving an IV antihypertensive medications. 73% of these patients who were injured were receiving hydralazine.
2. Injuries due to falls were not common but when an injury occurred it frequently resulted in bleeding.
3. Multiple falls were associated with an increased length of stay

LIMITATIONS

1. Retrospective chart review
2. Information dependent upon accurate charting and incident reports
3. Discrepancies between fall reports logged and chart information could not always be rectified

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