Intradialytic Hypertension in Patients Unergoing Hemodialysis in Tertiary Care Hospital

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Abstract

Introduction: Hypertension: Hypertension is defined as an increase in blood pressure (BP). Hypertension is a common cause in patients undergoing hemodialysis.

Intradialytic hypertension (IDH): IDH is defined the BP values from pre to post dialysis session exceeding BP values during dialysis onset. An increase in systolic blood pressure >10mmHg is considered as IDH.

Aim ·To study the intradialytic hypertension in patients undergoing hemodialysis in Kasturba hospital Manipal.

Objective: · To determine the prevalence of intradialytic hypertension in patients undergoing hemodialysis in Kasturba hospital Manipal.

Methodology: ·Study area: Kasturba Hospital Manipal

· Study population: out patients undergoing hemodialysis

· Study duration: 3 months

· Study design: prospective

· Inclusion criteria:

Ø End Stage Renal Disease patients

Ø Age above 21 year

· Exclusion criteria:

Ø Acute Kidney Injury patients

Ø ICU patients

Ø Post transplant patients

Ø Catheter patients

· Sample size:

n=Z²1-a/2pq Level of significance a=0.005

(ep) ²

Z1-a/2= 1.96, e(relative precision) = 0.10

Anticipated proportion, p= 0.7, q=1-p= 0.3

Sample size: 165

Result:·A study was conducted on 165 subjects who were undergoing hemodialysis. Out of 165 subjects 135 patients (81.8%) had intradialytic hypertension and 30 patients (18.2%) without intradialytic hypertension.

A study was conducted on 165 patients who were undergoing hemodialysis. Out of 165 subjects 2 female patients (4.9%), male 28 (22.6%) without intradialytic hypertension and 39 (95.1%), 96 (77.4%) males.

Conclusions: In this study the prevalence of IDH episodes was seen more in female patients (95.1%) than in male patients (77.4%) and out of 165 patients 135 patients had IDH and 30 patients without IDH

Key Words: *Intradialytic hypertension (IDH), Hemoglobin,·Hemodialysis, Hypertension, Chronic kidney disease (CKD)*

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Hypertension

Hypertension is defined as an increase in blood pressure (BP). Hypertension is a common cause in patients undergoing hemodialysis.

Chronic Kidney disease (CKD)

CKD is defined as Kidney damage for ³ 3months with or without decrease in GFR, as manifested by either

· Pathological abnormalities

· Markers of kidney damage, including abnormalities in the composition of blood or urine, or abnormalities in imagining test

GFR < 60ml/min/1.73m2 for ³3 months, with or without kidney damage

End-Stage Renal Disease (ESRD)

End-stage renal disease, also called end-stage kidney disease, occurs when chronic kidney disease — the gradual loss of kidney function — reaches an advanced state. In end-stage renal disease, the kidneys are no longer able to work as they should to meet the body's needs.

Intradialytic hypertension (IDH)

IDH is defined the BP values from pre to post dialysis session exceeding BP values during dialysis onset. An increase in systolic blood pressure >10mmHg is considered as IDH.

Causes of IDH

· Fluid overload

· Variation in the erythropoietin levels

· Variation in hemoglobin, calcium and PTH levels

A study Intradialytic hypertension: A less recognized cardiovascular complication of hemodialysis" conclude that the prevalence of intradialytic hypertension was up to 15% in hemodialysis patients. The study also stated that patients with blood pressure >130/80 mmHg is considered as intradialytic hypertension. (1) A study Mechanism and treatment of intradialytic hypertension concluded that in hemodialysis patients intradialytic hypertension is recognized as recurrent and persistent phenomenon and less dialyzable drugs should be managed for patients with intradialytic hypertension. (2)

A study "Intradialytic hypertension during chronic hemodialysis and subclinical fluid overload assessed by bioimpedance spectroscopy" concluded that the prevalence of intradialytic hypertension in patients undergoing hemodialysis was high than reported previously and fluid overload was the major factor for intradialytic hypertension. (3)A study the prevalence of persistent intradialytic hypertension in a hemodialysis population with extended follow-up concluded that the intradialytic hypertension prevalence was 21.3 per 100 treatments and volume related variable was only differed in patients with intradialytic hypertension. (6)A study probing the mechanism of intradialytic hypertension. A pilot study targeting endothelin dysfunction concluded that the patients with intradialytic hypertension had the modest improvement in endothelial functions and the frequency of intradialytic hypertension was reduced. (7)A study Intradialytic hypertension is a marker of volume excess concluded that changes in dry weight in hemodialysis patients with intradialytic hypertension. (8) Blood pressure (BP) measurement is a fundamental part of hemodialysis (HD) administration with measurements taken before and after HD and at frequent intervals during treatments. It is well-recognized that these peridialytic and intradialytic BP measurements are poorly reflective of interdialytic BP behaviour and overall cardiovascular disease burden. However, such BP measurements are essential for monitoring patient safety during dialysis. Peridialytic BPs and adverse clinical outcomes have a well-described "U"-shaped association, but no prospective studies have established optimal intervention thresholds on either end of the BP spectrum. Overt intradialytic BP abnormalities such as hypotension in a pale, diaphoretic patient or hypertension in a patient with headache and vision change are impossible to ignore. Such drastic presentations spark immediate intervention, and elegant studies demonstrating harm are not needed. While these extreme BP events occur more often than desired, they are relatively infrequent in today's era of bicarbonate-based dialysate and volumetric ultrafiltration (UF). (9)

The main cause for hypertension in dialysis where volume overload, Renin-angiotensin-aldosterone

system, Erythropoietin.

This study helps to know about the condition of the patient having intradialytic hypertension, also know the complications caused by intradialytic hypertension and what is the incidence of the condition also who are at better risk of getting intradialytic hypertension

Aim

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Methodology

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Procedure

This is an observational study conducted in dialysis unit of Kasturba Hospital Manipal. Patients diagnosed to have chronic kidney disease and in maintenance hemodialysis if fulfilling the inclusion criteria were included in the study.

165 patients with chronic kidney disease undergoing hemodialysis were selected randomly. Blood pressure was checked for ever hour (5 hours) and was recorded or noted

Statistical Analysis

McNemar's test was used to check the prevalence of IDH.

Result

A study was conducted on 165 subjects who were undergoing hemodialysis. Out of 165 subjects 135 patients (81.8%) had intradialytic hypertension and 30 patients (18.2%) without intradialytic hypertension.

Table 1: Patients with and without intradialytic hypertension.

		Frequency	Percent
IDH	Without IDH	30	18.2
	With IDH	135	81.8
	Total	165	100.0

A study was conducted on 165 patients who were undergoing hemodialysis. Out

of 165 subjects 2 female patients (4.9%) & 28 male patients (22.6%) without intradialytic hypertension and 39 female patients (95.1%) & 96 male patients (77.4%) with intradialytic hypertension.

Table 2: Sex distribution in patients with and without intradialytic hypertension.

SEX distribution * IDH					
			IDH		Total
			Without	With	
SEX	Female	Count	2	39	41
		% within SEX	4.9%	95.1%	100.0%
	Male	Count	28	96	124
		% within SEX	22.6%	77.4%	100.0%
Total		Count	30	135	165
		% within SEX	18.2%	81.8%	100.0%

Disucssion

It was seen that the intradialytic hypertension was a common complication in patients undergoing hemodialysis. Intradialytic hypertension was noted with a >10 mmHg increase in systolic blood pressure. The study was done to reduce the effect of intradialytic hypertension in patients undergoing hemodialysis.

All readings of blood pressure were confirmed by the qualified dialysis technologist, pursuing renal replacement therapy and dialysis technology post graduation. Complete monitoring of the patients was done. Some of the changes in erythropoietin dosage were seen during the study

Jula.K. Inrig done a study was he found that the occurrence of increase in blood pressure form pre to post dialysis session was seen in up to 15% of patients undergoing hemodialysis. He conducted a retrospective study on 438 patients undergoing hemodialysis and he found that 13.2% patients had increase in systolic blood pressure of more than 10mmHg from pre to post dialysis, but our study conducted on 165 patients undergoing hemodialysis found that 81.8% of patients had increase in systolic blood pressure more than 10mmHg from pre to post dialysis.

Limitations

- Long term follow up
- Single center study
- BP was checked by different people so there may be some variation

Conclusions

In this study the prevalence of IDH episodes was seen more in female patients (95.1%) than in male patients (77.4%) and out of 165 patients 135 patients had IDH and 30 patients without IDH

In this study the possible reasons for higher incidence of IDH were variations in erythropoietin, hemoglobin, calcium and PTH levels

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Conflict of Interest: NIL

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Ethical Clearance: The study was approved by the

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