

Prevalence and Risk Factors of Intradialytic Hypotension among Hemodialysis Patients at a University Hospital-Egypt

Liliane Iskander Narouz¹ & Zeinab M. El-Sayed²

1- Lecturer; Medical-Surgical Nursing Department, Faculty of Nursing, Cairo University-Egypt

2- Assist. Prof; Medical-Surgical Nursing Department, Faculty of Nursing, Cairo University-Egypt)

Corresponding Author: Liliane Iskander Narouz

Abstract:

Intradialytic hypotension (IDH) remains to be a major and distressful complication of hemodialysis. It may decrease the efficiency of the dialysis procedure and lead to adverse clinical outcomes that are clearly associated with the higher rate of morbidity and mortality among patients in hemodialysis. So, those patients require careful and frequent assessment each session and the nurse as an important health team member should be aware of the patient who is risky for intradialytic hypotension to provide the appropriate intervention.

Aim of the study: was to assess the prevalence of intradialytic hypotension and identify the risk factors associated with dialysis induced hypotension among patients in hemodialysis at a University Hospital-Egypt.

Research Questions: Q1: What is the prevalence of intradialytic hypotension among patients in hemodialysis?

Q2: What are the risk factors associated with dialysis induced hypotension among patients in hemodialysis?

Design: Retrospective cohort study design was utilized to achieve the aim of the current study.

Setting: The study was conducted in Nephrology and Dialysis Center at Kasr El-Aini affiliated to Cairo-University Hospital -Egypt.

Subjects: A convenient sample of 60 adult male & female patients was recruited in the current study. **Tools:** I) Personal data consisted of two parts: 1- Demographic data. 2- Medical data pertinent to medical diagnosis, weight, number of sessions, blood pressure, associate chronic diseases.....etc. II) Patient hemodialysis chart.

Results: Findings revealed that, the study subject's mean of age was ($X \pm SD = 43.1 \pm 14.8$) and 66.7% of them were male. The total number of session's induced intradialytic hypotension was 374 which represented 19.6 % of the total number of sessions with a mean of (6.77 ± 4.3). As well, 90% of the studied subjects experience intradialytic hypotension. Furthermore, there was a statistical significance mean of difference between systolic and diastolic blood pressure before and after dialysis sessions with t -test= 52.15 & 36.4 respectively. Also, there was a significant association between the occurrence of intradialytic hypotension and anemia / administration of antihypertensive drug (Concor5) among the study subject's with chi square= 8.34. and 12.98 respectively.

Conclusion: The current study concluded that, the prevalence of intradialytic hypotension during hemodialysis sessions was high. Moreover, anemia and antihypertensive drugs were the main factors lead to intradialytic hypotension among the studied subjects.

Recommendation: Replication of the current study on large sample size to determine the prevalence of intradialytic hypotension. Assessment and follow up for all patients before, during and after hemodialysis in order to detect early and manage intradialytic hypotension and subsequently improve nursing quality of care.

Key words: Intradialytic hypotension, hemodialysis, nursing intervention, risk factors, prevalence.

Date of Submission: 01-01-2019

Date of acceptance: 15-01-2019

I. Introduction

Hemodialysis is the most common and essential method for patients with end-stage renal disease (ESRD); is a critically important treatment that prolongs the survival time and improves the quality of life. However, hemodialysis is still a complicated and difficult therapy that requires a coordinated effort from all health care team (National Institute of Diabetes and Digestive and Kidney Diseases, 2016). Complications of hemodialysis (HD) create significant problems for renal practitioners, the health care system and especially for individuals living with end stage renal disease. It executes abundant psychological and physical stress on the patient (Shahdadi & Rahnama, 2018).

Hemodialysis (HD) patients have a risk for cardiovascular diseases than general population. One of the reasons might be the dialysis procedure itself that creates a stress on the cardiovascular system and in that way leading to advanced organ damage. Clinical experience dictates that HD patients are exposed to blood pressure variability as denoted by ambulatory blood pressure monitoring (ABPM) (Muntner, et al., 2011).

The most frequent complications during hemodialysis process includes arterial hypotension and hypertension, cramps, nausea, vomiting, headache, cardiac arrhythmias, itching, lumbar and thoracic back pain. Whereas the less common complications are pertinent to dialysis disequilibrium syndrome (DDS), hypersensitivity reactions, hypoxemia, hemorrhages, convulsions, pyrogenic reactions, hemolysis and gaseous embolism (Dallé & Lucena, 2012).

Intradialytic hypotension (IDH) is a serious clinical problem, comprising a sudden symptomatic drop in blood pressure (BP) during hemodialysis; that will increase mortality in the dialyzed patients if not treated appropriately. IDH is the most frequent severe side effect of hemodialysis treatment, with a reported incidence from 25% to 50% (Bradshaw, Bennett, Hutchinson, Ockerby & Kerr, 2017).

Symptomatic hypotension during or immediately after hemodialysis was complicated 5 to 30 percent of all dialysis treatments. In one study that encompassed 44,801 dialysis treatments in 1137 patients, 75 percent of patients had at least one episode of intradialytic hypotension. In some patients, more than 50 percent of treatments are complicated by intradialytic hypotension. Additionally, low blood pressure may be associated with shortness of breath, abdominal and muscle cramps, nausea or vomiting (Sands, Usvya & Sullivan, 2014 and Reilly, 2014).

There is no generally accepted definition of intradialytic hypotension. Kidney Disease Outcomes Quality Initiative (KDOQI) and European Best Practice Guidelines define intradialytic hypotension as the presence of a decrease in systolic blood pressure ≥ 20 mmHg or a decrease in mean arterial pressure by 10 mmHg, accompanying with symptoms and need nursing intervention. In some patients, the development of hypotension necessitates intravenous fluid replacement before patients are able to safely leave the dialysis unit (Okoye, Slater & Rajora, 2017).

Diagnostic criteria of intradialytic hypotension are highly debatable (Wang, Chen & Chen, 2018). IDH can result from numerous causes, as rapid fluid removal, diminished cardiac reserve and intake of medications that alter cardiovascular stability, use of low-sodium dialysate and eating of a meal immediately before or during dialysis. Accordingly, it can lead to increased incidence of ischemic events, both cardiovascular and cerebral, vascular access thrombosis, arrhythmias, fluid overload which affect the well-being of these patients (Flythe, 2013).

In this regard, identifying risk factors of intradialytic hypotension is critical and beneficial for the nurse to achieve optimal patient's outcomes. Therefore, the nephrology nurse plays a vital and important role in accurately assessing, caring, teaching and counseling those patients. Nurses are health care providers who actively involved in prevention and early detection of patient who is risky for intradialytic hypotension and they will need to work in collaboration with the nephrologists, nutritionists, social workers, patients, and patient's family. For that reason, the aim of the current study was to assess the prevalence of intradialytic hypotension and Identify the risk factors associated with dialysis induced hypotension among patients in hemodialysis.

Significance of the study:

Worldwide; the prevalence rates of chronic kidney disease (CKD) are high and have increased in the last few years to about 13–15% (Ahmed, Yassin, Boules, 2016). In Egypt, despite the prevalence of ESRD continues to increase; there are no recent data about the prevalence of ESRD. According to Ahmed et al, (2010) the estimated prevalence of renal failure in Egypt is 109, 7052 of 76, 117, 42122 and the estimated annual incidence of CKD is around 74 per million population (pmp) while the hemodialysis prevalence rate was 414 patients pmp. (Zahran, 2011).

In actual fact; hemodialysis is the most common method for kidney replacement treatment however it induced complications such as intradialytic hypotension (IDH) which considered the major frequent complication of hemodialysis occurring in 20% to 50% of dialysis sessions. It is also a significant independent factor affecting mortality in hemodialysis patients (Johanna, Jurjen, Wim, Judith, 2018). However, studies on the prevalence of IDH are relatively scarce. Furthermore, from the researcher assessment, there is no published reference to explore the prevalence of intradialytic hypotension at El Kasr Aini Nephrology and Dialysis Center.

The nurse plays an important role in assessing, controlling, protecting and training of the patient to prevent dialysis induced hypotension. So, it is vital to focus on the assessment of the prevalence of intradialytic hypotension and Identify the risk factors associated with dialysis induced hypotension that will help in developing nursing management guidelines and optimizes patient's outcomes. In addition, it will enhance level of quality care and the current results hoped to increase the nursing knowledge and research database.

II. Material and Methods

The Aim: The aim of the current study was to assess the prevalence of intradialytic hypotension and Identify the risk factors associated with dialysis induced hypotension among patients in hemodialysis at a University Hospital-Egypt.

Research Questions:

Q1: What is the prevalence of intradialytic hypotension among patients in hemodialysis?

Q2: What are the risk factors associated with dialysis induced hypotension among patients in hemodialysis?

Study Design: Retrospective cohort study design was utilized to achieve the aim of the current study. A retrospective cohort study uses data that has already been collected. In a retrospective study, the outcome of interest has already occurred at the time the study is initiated. It allows the investigator to formulate ideas about possible associations and investigate potential relationships, although causal statements usually should not be made (Maninder, 2016).

Settings: The study was conducted in Nephrology and Dialysis Center at Kasr El-Aini affiliated to Cairo-University Hospital -this center with a capacity of 45 dialysis machines.

Subjects: 60 hemodialysis patients out of 175 which were the total capacity of the center and who started hemodialysis (HD) from June, 2018 to August, 2018 at El Kasr Aini Nephrology and Dialysis Center and fulfill the **Inclusion criteria:** Aged ≥ 18 years, undergoing maintenance hemodialysis (MHD) in-three time-weekly basis for at least 3 months.

Tools

In order to achieve the aim of the current study two tools were utilized to gather the pertinent data as follows:

- **Tool I:** Personal data which consisted of two parts: **Part I:** Demographic data which covers items about the background of the patients such as age, gender. **Part II:** Medical data pertinent to medical diagnosis, number of sessions, blood pressure, associate chronic diseasesetc.
- **Tool II:** Patient hemodialysis chart, reviewed and recorded by the researchers, it includes, Number of dialysis sessions per month, Dry weight, average weight gain, withdrawal rate, Blood pressure measuring (pre-Intra-post dialysis), associate chronic diseases, occurrence and percentage of intradialytic hypotension and medication administration.
-

Ethical consideration:

An official permission was taken from the hospital administrators. Followed by an approval from the director of the Nephrology and Dialysis Center after the researchers emphasized that, the anonymity and confidentiality are assured though coding the data.

Procedure

Once official permission was agreed from the General Director of El kasr El Aini University hospital and the Nephrology and Dialysis Center; a visit to the archive system was done to retrieve the list of names for hemodialysis patients (176 patients) after giving wholly explanation about the nature of the study. Then the researcher selects the patient's chart which fulfills the inclusion criteria of the current study till the number reached 60 patients in order to be statistically appropriate. After that, a list of the 60 patients was made and patient's files were checked for the data needed to support the study results. Each patient's file was assessed for the last 3 months starting from June, July till August 2018.

The tools were filled by collecting the following data: number of hemodialysis sessions, prevalence of hypotension through the whole each patient's sessions, hypotension symptoms, dry weight, weight gain, amount withdrawal, associate chronic diseases, causes of renal disease, laboratory investigations and medications administration. Tools were filled based on the previous data.

Statistical analysis:

The data was coded and tabulated using a Statistical Package for Social Science (SPSS) version 20.0. Data was presented using descriptive statistics in the form of frequencies and percentage, mean and standard deviation. Inferential statistics as Chi-square, r and t test were performed. Statistical significance was considered at $p\text{-value} \leq 0.05$

III. Result

Results of the current study are presented into three sections; **Section I:** represents the study subjects' demographic and medical data. Findings revealed that 45% of the studied subjects their age ranged between 18->40, while 55% of them their age ranged between 40 -<60 with Mean of age ($X \pm SD = 43.1 + 14.8$). Pertinent to gender 66.7% of the study subjects were male. In relation to the medical data **Table I** observed that, 83% of the

studied subjects were suffering from different associate chronic diseases distributing as the following; 70 % of the studied subjects had hypertension, 41.7 % had diabetes while ischemic heart disease (IHD) and anemia were similar 16.6 %. These percentages were more than 83% because each patient had more than one associate disease. Regarding the causes of end stage renal disease among the studied subjects, long standing hypertension represented 40% followed by urolithiasis, obstructive renal diseases, Glomerulonephritis and renal atrophy which represented (21.7%, 26.7%, 8.3%, & 3.3 %) respectively.

Concerning the current medication used; (96.7%) of the studied subjects administer One alpha drug followed by Calcimate (88.5%), while administration of Asprocid 75 mg was the less frequent medication among the studied subjects represented (11.5%). Table 1 also illustrated that, the mean dry weight of the patients was 81.1 + 20.2 kg.; the mean weight gain was 78.3 + 20.4 kg. Whereas the mean interdialytic weight gain (IDWG) of them was 2.6 + 1.01 kg.

Table 1: Description of the study subjects' medical related data (n= 60).

Medical data	No	(%)
Associate chronic diseases:		
- Yes	51	83.6%
- No	9	16.4%
*Types of chronic diseases:		
- Hypertension	42	70%
- Diabetes	25	41.7%
- Heart disease * IHD	10	16.6%
- Anemia	10	16.6%
Cause of End Stage Renal disease		
- Long standing Hypertension	24	40%
- Urolithiasis	13	21.7%
- Obstructive renal disease	16	26.7%
- Glomerulonephritis	5	8.3%
- Renal atrophy	2	3.3%
*Current Medications:		
- Asprocid 75 Mg	7	11.6 %
- Eprex (Erythropoietin)	43	71.6%
- Alkapress (antihypertensive)	27	45 %
- Becozyme (B Complex)	22	36.6%
- Calcimate (Calcium Citrate Maleate)	53	88.3%
- one Alpha (calcium metabolism)	58	96.6%
- Ferosac (Iron Sacharrate Complex)	25	41.6%
- Concor 5 (antihypertensive)	24	40%
Weight	Mean±SD	
- Dry weight:	-	81.1 + 20.2 kg
- Weight gain:	-	78.3 + 20.4 kg
Intradialytic weight gain (IDWG):	-	2.6 + 1.01 kg

Section II: Clarified the number of dialysis sessions and answer of the current study first question which related to the prevalence of intradialytic hypotension. **Table 2** indicated that, the total number of dialysis sessions recorded through consecutive 3 months for the 60 studied patients was 1867 sessions with a mean number of dialysis sessions (31.1±5.1) for each patient. Furthermore, number of sessions induced intradialytic hypotension was 374 which represented 19.6 % of the total number of sessions with a mean of (6.77±4.3). As well, 90% of the studied subjects experience intradialytic hypotension. Related to percentage of intradialytic hypotension Table 2 also illustrated that, 25% of the subjects experienced hypotension only in less than 10% of the total percentage of sessions while 40 % and 35 % of them experienced hypotension in 10-20% and more than 20% of the total percentage of sessions respectively. In addition, only 30 % of the studied subjects developed hypotension symptoms.

Table 2: Frequency distribution of dialysis sessions and intradialytic hypotension among the study subjects (n=60)

Item	No.	%	X ± SD
Total dialysis sessions through 3 months	1867	100%	31.1 ± 5.1
No. of sessions in which intradialytic hypotension occurs	374	19.6%	6.77 ± 4.3
No. of patients who experience Intradialytic Hypotension	54	90%	
Percentage of intradialytic hypotension from total			

sessions			
- < 10% of total sessions	15	25%	15.6 ± 2.1
- 10- 20 % of total sessions	24	40%	
- < 20% of total sessions	21	35%	
Patients who developed Hypotensive symptoms	18	30%	

Regarding patients' blood pressure before and after dialysis sessions **table 3** indicated that, the mean systolic blood pressure before and after dialysis sessions was (135.2mmhg-110mmhg) respectively; while the mean diastolic blood pressure before and after dialysis sessions was (85.2 mmhg-70.3mmhg) respectively. In addition, there was a statistical significance mean of difference between systolic and diastolic blood pressure before and after dialysis sessions with t-test= 52.15 & 36.4 respectively.

Table 3: Mean systolic and diastolic blood pressure before and after dialysis session among study subjects (n=60).

Systolic pressure before dialysis	Systolic pressure after dialysis	Paired t test	Diastolic pressure before dialysis	diastolic pressure after dialysis	Paired t test
Mean±SD	Mean±SD		Mean±SD	Mean±SD	
135.2 ± 15.5 mmhg	110.2 ± 13.2 mmhg	52.15* P=0.000	85.2 ± 8.7 mmhg	70.3 ± 8.6 mmhg	36.4* P=0.000

*Significant at p < 0.05

Section 3: Denote the risk factors related to intradialytic hypotension among the study subjects.

Table 4, articulated that, there was no significant association between age, gender and the intradialytic hypotension among the study subjects (Chi square = 3.03& 0.731 at P > 0.005) respectively.

Table 4: Association between intradialytic hypotension and demographic data among the study subjects (n=60)

Item	Intradialytic hypotension (of total sessions)			Test
	< 10 %	10-20%	>20%	
Age:				Chi square 3.03 *NS
- 18-29	3	5	4	
- > 29-39	4	6	5	
- >40-50	4	2	4	
- >50-60	4	7	4	
- >60	1	4	3	
Gender:				Chi square 0.731*NS
- Male	12	15	13	
- Female	4	9	7	

*NS= Not significant.

Related to intradialytic hypotension and medical data of the studied subjects. **Table5,** illustrated that, there was a significant association between the occurrence of intradialytic hypotension and complaining of anemia among the studied subject's with chi square= 8.34 at p > 0.005. Also, Regarding the use of medication, there was a significant association between the intradialytic hypotension and antihypertensive drug (Concor5) among the studied subject's with chi square= 12.98 at p > 0.005. while, there was no statistical relation between intradialytic weight gain and the prevalence of intradialytic hypotension with r test =0.09.

Table (5): Association between intradialytic hypotension and medical data of the study subjects (n=60).

Item	Intradialytic hypotension (of total sessions)						Test	
	< 10 %		10-20%		< 20 %			
	No	%	No	%	No	%		
Comorbidities:							Chi square	
- Hypertension	12	20	17	28.3	13	21.6		0.43
- Diabetes	3	5	7	11.6	6	10	0.97	
- Ischemic heart disease	1	1.7	5	8.3	4	6.6	2.81	
- Anemia	----	----	3	5	7	11.6	8.34*	
Medication:							Chi square	
- Calcimate	13	21.6	23	38.3	18	30		2.26
- One alpha	15	25	24	40	20	33.3		2.79
- Eprex	12	20	16	26.6	16	26.6		1.02
- Aspocid	3	5	1	1.66	3	5		2.3
- Alkapres	8	13.3	11	18.3	9	15	0.10	

- Becozyme	4	6.66	8	13.3	11	18.3	3.8
- Concor 5	6	10	4	6.66	14	23.3	12.98*
- Ferrosac	6	10	10	16.6	9	15	0.26
Intradialytic weight Gain (IDWG):	r test = 0.09 *NS						

*Significant at p <0.05

*NS= Not significant.

IV. Discussion

The majority of patients undergoing hemodialysis suffering from intradialytic hypotension that ranged between 28–40 mmHg. It considered as a serious and frequent complication of hemodialysis (Patrick & Finnian, 2018). Therefore, the discussion was presented into three parts: **Part I:** Highlight the demographic and medical data. **Part II:** Focus on the prevalence of intradialytic hypotension and **Part III:** Illustrated the risk factors associated with intradialytic hypotension.

Part I discovered that more than half of the studied subjects their age was ranged between forty to less than sixty with Mean of age ($X \pm SD = 43.1 + 14.8$) and more than two third of them were male, In the light of these findings (Elmoghazy, Hassan, Sorour and Donia, 2016), who studied nursing intervention for enhancing hemodialysis patient adherence to therapeutic regimen displayed that, 45.8% of the study sample was at age group less than 40 with the mean age 40.9 ± 10.8 and Sixty five point eight percent of study sample was male. This is closed also to (Ghonemy, Farag, Soliman, El-okely & El-hendy, 2016) who conducted a cross-sectional study in 15 dialysis centers in governmental hospitals in El-Sharkia, Egypt reported that, the mean age of the patients was $52.03 + 14.67$ years. and 62.2% of them were males. In addition, the study of (Soliman, Fawzy, Kandil, & Abd el Fattah, 2014) who assess hypotension during dialysis as a manifestation of myocardial ischemia in patients with chronic renal failure found that, the mean age of the study sample was $44 + 13$ and 40% of them was male.

In relation to the medical data, the researcher found that, the majority of the studied subjects suffering from different associate chronic diseases mainly hypertension which represented about two third of the studied subjects, and near to half of them had diabetes while the rest of the patients less than one third had ischemic heart disease (IHD) and anemia. Moreover, the most common cause of end stage renal disease observed among approximately half of the studied subjects was hypertension. Even though about one third only of the patients caused by urolithiasis and obstructive renal diseases, from the other side a few numbers of them caused by Glomerulonephritis and renal atrophy. Which was seemed logic as hypertension considered the vigorous indicator for renal disease from its adverse effect on patient's blood vessels and their body system in general. As (Ghonemy, Farag, Soliman, El-okely & El-hendy, 2016) who conducted a study of the epidemiology and risk factors of chronic kidney disease in the El-Sharkia Governorate, Egypt. Found that, the distributions of the leading causes of ESRD were the following: hypertension = 31.8%, diabetes mellitus = 15.5%, urinary tract infection = 8.8%, kidney stone = 8.4%, unknown = 17.7%, primary glomerulonephritis = 3.7% and drug/toxin = 3.5%. Additionally, (Okoye, Slater & Rajora, 2017) explored that, the main cause of renal disease was chronic glomerulonephritis (28.1%), hypertension (27.5%) Diabetes (19.2%), Obstructive nephropathy (10.9%), HIV associated Nephropathy (6.0%) amongst others. Likewise, El Minshawy, (2011) displayed that, in some Egyptian governorates like Cairo, Canal and Minya governorates the main cause of ESRD was hypertension which represented (29.7%, 27.3%, 20%) respectively.

In relation to the current medication almost all of the patients administered One alpha and Calcimate drugs while two fifth of them administer antihypertensive drug (Concor5). Melamed & Thadhani, (2012) explained that, Patients with kidney disease have reduced activity of the enzyme 1- α hydroxylase in the kidneys, which converts 25-hydroxyvitamin D to its more active form, 1,25-dihydroxyvitamin D and thus patients with kidney disease have traditionally been given vitamin D replacement with active, 1,25-dihydroxyvitamin D or a related analog. From the researcher point of view this might give to the nurse a clue about the importance of monitoring those patients who administer one alpha drugs for its side effects beside check usually their calcium and phosphorus serum levels. As regards patient's weight the mean dry weight of the studied subjects was $81.1 + 20.2$ kg. and the mean weight gain was $78.3 + 20.4$ kg. Whereas the mean interdialytic weight gain (IDWG) of them was $2.6 + 1.01$ kg. this result is congruent with (Kahraman, et.al, 2015) who reported that the mean IDWG was 2.7 ± 1.1 and confirmed that the values of weight gain presented similarity with the other studies. Ipema, et.al, (2016) who studied the causes and consequences of interdialytic weight gain mentioned that, interdialytic weight gain (IDWG) is the result of salt and water intake between two haemodialysis sessions. IDWG is used as a parameter for fluid intake while taking the daily urine output into account. Gunal, (2013) added that, in a patient with good compliance with salt restriction, the interdialytic weight gain does not exceed 2 kg (3% of the dry weight). On the other hand, (Lai, et.al, 2012) reported that, there were different opinions about weight gain because sometime increase in body weight is due to change in body fat and body mass index not only as a result of hypervolemia.

Part II explored that, the mean number of dialysis sessions was 31.1± 5.1 and this is the known average number of sessions as each patient undergone hemodialysis 3 times per week through three months. As regards the first question of the current study; what is the prevalence of intradialytic hypotension among patients in hemodialysis? The findings illustrated that, the majority of the study subjects experienced intradialytic hypotension (IDH) during the 3 months period as the following near to half of them suffering from intradialytic hypotension in 10-20% of the total percentage of sessions; and more than one third of them experienced hypotension in more than 20% of the total percentage of sessions while the rest of the studied subjects experienced hypotension less than 10% of the total sessions. Furthermore, only about one third of patients developed hypotension symptoms. This result was matched with (Kuipers, et. al, 2016) who reported that intradialytic hypotension occurs up to 20-50% among the hemodialysis patients, and they added that, identifying intradialytic hypotension is complicated because of the use of different definitions for hypotension. While (Soliman et.al, 2014) reported that intradialytic hypotension happened up to 25% of the total number of dialysis session. Furthermore, the change in blood pressure pre and post-dialysis the current study findings clarified that, there was a statistical significance mean of difference between systolic/diastolic pre and post dialysis sessions. This result may be because the majority of the study subjects experienced intradialytic hypotension at least once during the three months period and was matched with (Okoye, Slater & Rajora, 2017) who reported that pre-dialysis systolic blood pressure and diastolic blood pressure were 145 ± 32mmHg and 82 ± 20 mmHg respectively and the change was about 20 mmhg in the systolic and diastolic pressure. IDH might lead to intense disturbance in dialytic clearance so, the researcher highlighted that it is crucial to monitor all patient's blood pressure during hemodialysis to detect intradialytic hypotension and provide nursing intervention not only to those who develop symptoms.

Regarding the second question of the current study which is what are the risk factors associated with dialysis induced hypotension among patients in hemodialysis? **Part III** clarified that, there was no association between demographic characteristics (age, gender) and intradialytic hypotension, this result is contradicted with (Mahmood, Hassan, Mahmood & Bari 2017) who reported that there is association between increase of age above 65 years old, female sex and the decrease in blood pressure. Even though the current study findings explored that, there was a statistically significant association between anemia / antihypertensive drug (Gongor5) and intradialytic hypotension (IDH) while other factors such as diabetes and ischemic heart disease not significant. This result is matched with (Chao, Huang & Yen, 2015) who illustrated that, the accompanied poorer malnutrition statuses may have devastating influences and worsening of anemia would lead to pressure overload and contribute to subsequent left ventricular hypertrophy progress. While (Okoye, Slater & Rajora, 2017) concluded that, some of the risk factors of IDH in Chronic kidney patients include: severe anemia, in addition to diabetes mellitus, cardiovascular disease (CVD), poor nutritional status and hypoalbuminemia, autonomic dysfunction were also related to intradialytic hypotension. This shed light on the importance of nutritional assessment and also giving of nursing instructions for those patients who received antihypertensive drugs to minimize the occurrence of intradialytic hypotension.

V. Conclusion

The current study concluded that, the prevalence of intradialytic hypotension during hemodialysis sessions was high. Moreover, anemia and antihypertensive drugs were the main factors lead to intradialytic hypotension among the studied subjects.

VI. Recommendations

Based on the current study findings the following are recommended:

1-Consideration should be taking for patients undergoing hemodialysis in order to improve patients' condition and enhance quality of nursing care:

1.1- Awareness of nurses with factors, signs & symptoms associated with intradialytic hypotension and nursing

measures through training courses.

1.2- Assessment and follow up for all patients before, during and after hemodialysis in order to detect early and

manage intradialytic hypotension.

1.3- Nutritional assessment for the patients undergoing hemodialysis.

1.4- Assess and monitor the patients receiving antihypertensive drugs.

2- Further studies should be conducted for the following purposes:

2.1- Assess other factors of intradialytic hypotension.

2.2- Replication of the current study on large sample size.

VII. Nursing implications

Nurses have an important role & responsibility to assist the patients to receive appropriate nursing care and treatment through assessment and follow the patient before, during and after hemodialysis sessions. Awareness of nurses about the prevalence, risk factors associated with intradialytic hypotension is beneficial and will achieve optimum level of nursing care.

References

- [1]. Ahmed, A., M., F., Allam, E.S., Habil, A.M., Metwally, N.A., Ibrahiem, M., Radwan, M.M., El-Gaafary, A., Afifi, M.A., & Gadalla, M.A., (2010): Development of practice guidelines for hemodialysis in Egypt National Research Center, Department of Community, Environmental and Occupational Medicine, Ain Shams University.
- [2]. Ahmed, R., E, Yassin, S., Y., & Boules, N., B., (2016): Study of prevalence of end-stage renal disease in Assiut governorate, upper Egypt. *Menoufia Medical Journal* 2016, Volume: 29 | Issue: 2 Page: 222-227.
- [3]. Bradshaw, W., Bennett, P.N., Hutchinson, A.M., Ockerby, C., & Kerr, P., G., (2017): Preventing intradialytic hypotension: Translating evidence into practice. *Nephrology Nursing Journal*, 44(2), 131-138, 151.
- [4]. Chao, C., T., Huang, & Yen, C., J., (2015): Intradialytic Hypotension and Cardiac Remodeling: A Vicious Cycle. *Biomed Res Int*. 2015; 2015: 724147.
- [5]. Dallé, J., & Lucena, A., F., (2012): Nursing diagnoses identified in hospitalized patients during hemodialysis. *Acta paul. Enferm.* vol.25 no.4 São Paulo 2012.
- [6]. El Minshawy, O., (2011): End-stage renal disease in the El-Minia Governorate, upper Egypt: An epidemiological study. *Saudi J Kidney Dis Transpl* 2011; 22:1048-54.
- [7]. Elmoghazy, G., E., E., Hassan, S., A., A., Sorour, A., S., & Donia, A., F., (2016): Nursing Intervention for Enhancing Hemodialysis Patient Adherence to Therapeutic Regimen. *Journal of American Science* 2016; 12(11).
- [8]. Flythe, J., E., Inrig, J., K., Shafi, T., Chang, T., I., Cape, K., Dinesh, K., Kunaparaju, S., et al. (2013): Association of intradialytic blood pressure variability with increased all-cause and cardiovascular mortality in patients treated with long-term hemodialysis. *Am J Kidney Dis* 2013; 61:966.
- [9]. Ghonemy, T., A., Farag, S., E., Soliman, S., A., El-okely, A., & El-hendy, Y., (2016): Epidemiology and risk factors of chronic kidney disease in the El-Sharkia Governorate, Egypt. *Saudi J Kidney Dis Transpl* 2016, Volume: 27, Issue: 1, Page: 111-117.
- [10]. Gunal, A., L., (2013): How to determine 'dry weight'? *Kidney Int Suppl* (2011). 2013 Dec; 3(4): 377-379.
- [11]. Ipema, K., J., R., Kuipers, J., Westerhuis, R., Gaillard, C., A., J., M., van der Schans, C., P., Krijnen, W., P., & Franssen, C., F., M., (2016): Causes and Consequences of Interdialytic weight gain. *Kidney. Blood Press Res* 2016; 41:710-720.
- [12]. Johanna, K., Jurjen, K., O., Wim, P., K., & Judith, J., D., (2016): Prevalence of intradialytic hypotension, clinical symptoms and nursing interventions - a three-months, prospective study of 3818 haemodialysis sessions. *Research Gate Journal, BMC Nephrology* 17(1):21 February 2016.
- [13]. Kahraman, A., Akdam, H., Alp, A., Huyut, M., A., Akgullu, C., Balaban, T., Dinleyen, F., Topcu, A., Gelmez, H., Atakan, N., Akar, H. & Yenicieroglu, Y., (2015): Impact of Interdialytic Weight Gain (IDWG) on Nutritional Parameters, Cardiovascular Risk Factors and Quality of Life in Hemodialysis Patients. *BANTAO Journal* 2015; 13(1): 25-33; doi:10.1515/bj-2015-0006.
- [14]. Kuipers, j., Oosterhuis, J., K., Krijnen, W., P., Dasselara, J., J., Gaillard, C., A. J. M., Westerhuis, R. & Franssen, C., F. M., (2016): Prevalence of intradialytic hypotension, clinical symptoms and nursing interventions - a three-months, prospective study of 3818 haemodialysis sessions *BMC Nephrology* 2016; 17:21.
- [15]. Lai, C., T., Wu, C., J., Chen, H., H., Pan, C., F., Chiang, C., L., Chang, C., Y., & Chen, Y., W., (2012): Absolute interdialytic weight gain is more important than percent weight gain for intradialytic hypotension in heavy patients. *Nephrology (Carlton)*. 2012;17: 230-236.
- [16]. Mahmood, N., Hassan, M., Mahmood, F. & Bari, S., (2017): Hypotension During Haemodialysis: Etiology, Risk Factors and Outcome. *AKMMC J* 2017; 8(2): 89-93.
- [17]. Maninder, S., S., (2016): Methodology Series Module 1: Cohort Studies. *Indian J Dermatol*. 2016 Jan-Feb; 61(1): 21-25.
- [18]. Melamed, M., L., & Thadhani, R., I., (2012): Vitamin D Therapy in Chronic Kidney Disease and End Stage Renal Disease. *Clin J Am Soc Nephrol*. 2012 Feb; 7(2): 358-365.
- [19]. Muntner P, Shimbo D, Tonelli M, Reynolds K, Arnett DK, & Oparil S., (2011): The relationship between visit-to-visit variability in systolic blood pressure and all-cause mortality in the general population: findings from NHANES III, 1988 to 1994. *Hypertension* 2011; 57: 160-166.
- [20]. National Institute of Diabetes and Digestive and Kidney Diseases (2016): Treatment methods for kidney failure: Hemodialysis. <http://kidney.niddk.nih.gov/kudiseases/pubs/hemodialysis/>. Accessed June 8, 2016.
- [21]. Okoye, O., C., Slater, H., E., & Rajora, N., (2017): Prevalence and risk factors of intra-dialytic hypotension: a 5-year retrospective report from a single Nigerian Centre. *Pan Afr Med J*. 2017; 28: 62.
- [22]. Reilly, R., F., (2014): Attending rounds: A patient with intradialytic hypotension. *Clin J Am Soc Nephrol*. 2014; 9:798.
- [23]. Sands, J., J., Usvyat, L., A., Sullivan, T., et al, (2014): Intradialytic hypotension: frequency, sources of variation and correlation with clinical outcome. *Hemodial Int* 2014; 18:415.
- [24]. Shahdadi H., & Rahnama, M., (2018): Experience of Nurses in Hemodialysis Care: A Phenomenological Study. *J Clin Med*. 2018 Feb; 7(2): 30.
- [25]. Soliman, R., A., Fawzy, M., Kandil, H., & Abd el Fattah, A. (2014): Assessment of hypotension during dialysis as a manifestation of myocardial ischemia in patients with chronic renal failure. *The Egyptian Journal of Critical Care Medicine* Volume 2, Issue 1, April 2014, Pages 13-18.
- [26]. Wang, Z., Chen, Z., & Chen, X., (2018): The prevalence of intradialytic hypotension under different diagnostic criteria and its association with mortality. *Nephrology Dialysis Transplantation*, Volume 33, Issue suppl_1, 1 May 2018, Pages i556,
- [27]. Zahran, A. (2011): Epidemiology of hemodialysis patients in Menofia governorate, Delta region, Egypt. *Menoufiya Medical Journal*. Jul; 24 (2): 59

Liliane Iskander Narouz. "Prevalence and Risk Factors of Intradialytic Hypotension among Hemodialysis Patients at a University Hospital-Egypt" .IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 8, no.01 , 2019, pp. 61-68.

- [20]. Okoye, O., C., Slater, H., E., & Rajora, N., (2017): Prevalence and risk factors of intra-dialytic hypotension: a 5-year retrospective report from a single Nigerian Centre. *Pan Afr Med J.* 2017; 28: 62.
- [21]. Reilly, R., F., (2014): Attending rounds: A patient with intradialytic hypotension. *Clin J Am Soc Nephrol.* 2014; 9:798.
- [22]. Sands, J., J., Usvyat, L., A., Sullivan, T., et al, (2014): Intradialytic hypotension: frequency, sources of variation and correlation with clinical outcome. *HemodialInt* 2014; 18:415.
- [23]. Shahdadi H., & Rahnama, M., (2018): Experience of Nurses in Hemodialysis Care: A Phenomenological Study. *J Clin Med.* 2018 Feb; 7(2): 30.
- [24]. Soliman, R., A., Fawzy, M., Kandil, H., & Abd el Fattah, A. (2014): Assessment of hypotension during dialysis as a manifestation of myocardial ischemia in patients with chronic renal failure. *The Egyptian Journal of Critical Care Medicine* Volume 2, Issue 1, April 2014, Pages 13-18.
- [25]. Wang, Z., Chen, Z., & Chen, X., (2018): The prevalence of intradialytic hypotension under different diagnostic criteria and its association with mortality. *Nephrology Dialysis Transplantation*, Volume 33, Issue suppl_1, 1 May 2018, Pages i556,
- [26]. Zahran, A. (2011): Epidemiology of hemodialysis patients in Menofia governorate, Delta region, Egypt. *Menoufiya Medical Journal.* Jul; 24 (2): 59