Effect of Nursing Guidelines on Controlling Adverse Events of plasmapheresis among Patients with Autoimmune Diseases

Naglaa Abd Allah Abd El Hafeez [(1)], Heba Gebril [(2)], Jehan Y. ElRazkey [(3)], Marwa Khalil Hafez [(4)]
(1,2, 4) Assess. Prof. of Medical-Surgical Nursing. Faculty of Nursing. Alexandria University, Egypt.
(3) Lecturer of Medical-Surgical Nursing. Faculty of Nursing. Alexandria University, Egypt.

Abstract

Background: Plasmapheresis is one of the most common techniques of extracorporeal blood purification, which involves removing inflammatory mediators and antibodies. Autoimmune diseases are among the many conditions for which the technique is employed. **Aim**: to investigate the effect of nursing guidelines on controlling adverse events of plasmapheresis among patients with autoimmune diseases. **Setting:** The study was accomplished at the Main University Hospital's Hemodialysis Unit, Alexandria, Egypt. **Materials and Method:** To carry out this study a quasi-experimental research design was utilized. A convenient sample of 60 patients with autoimmune diseases who are scheduled for undergoing plasmapheresis procedure was selected from the above mentioned setting. **Tools:** Biosociodemographic characteristics structured interview schedule and plasmapheresis adverse events observational checklist, were utilized for data collection. **Results:** highly statistically significant differences between both groups of the study were detected as regards nausea & vomiting, fatigue, joint pain & cramps, rash & itching and insertion site swelling, where p = (0.004, 0.007, <0.001, <0.001 & <0.001) respectively after application of nursing guidelines. **Conclusion:** the majority of patients in the study group had a statistical significant improvement in the total mean scores during the second and third observation of plasmapheresis related adverse events after applying the nursing guidelines. **Recommendation:** The current study should be replicated on larger probability samples.

Keywords: Adverse events, Plasmapheresis, Nursing guidelines, Auto-immune diseases

Introduction

Autoimmune disease is characterized by the presence of self-reactive immune components known as “autoantibodies” plus clinically obvious pathology. Autoimmune diseases are dramatically increasing all over the world most commonly in the US. The National Institution of Health (NIH) evaluates up to 23.5 million USA citizens troubled with autoimmune diseases, indicating an ascending prevalence. Hamza et al., (2019). Interestingly, 32% of adults aged 60 and over had at least one of these autoantibodies, including anti-tissue trans-glutaminase autoantibodies (linked to gluten-sensitive enteropathies), anti-thyroglobulin autoantibodies (linked to autoimmune thyroid disease), and rheumatoid factor (most frequently linked to rheumatoid arthritis). For instance, 18% of US individuals had thyroid autoantibodies alone, which included 10% of younger adults and 25% of older adults. Dinse et al., (2022) & Frederick. (2023).

Numerous genetic and environmental risk factors that interact over time are the primary potential causes of autoimmune disorders. Subclinical immune activation and autoimmunity results and finally a phenotype meeting followed by autoimmune disease evolution then early clinical signs and symptoms would be apparent. Changes in our nutrition, infections, personal habits, rising obesity rates, lack of sleep, stress, air pollution, and the effects of climate change are examples of environmental influences. In modern society, autoimmune disorders have had a catastrophic effect on individuals and caregivers, leading to substantial public and private expenses due to significant health care consumption. However, autoimmune diseases are predicted to become increasingly common medical conditions in the future. Therefore, knowledge of the pathophysiology, risk factors, diagnostic procedures, treatment, and preventive strategies of autoimmune diseases is essential. Caliskan et al, (2021).

Plasmapheresis had been suggested as the preferred protocol of management for autoimmune diseases which is now overseen within the apheretic units at many hospitals. Because therapeutic plasmapheresis (TP) can aid in the removal of harmful materials with a high molecular weight, such as immune-globulins, immune complexes, or inflammatory mediators from plasma, it has been used to treat autoimmune illnesses. According to the 2019 American Society for Apheresis (ASFA) guidelines, plasmapheresis is defined as "A therapeutic procedure in which the blood of the patient is passed through a medical device which separates plasma from the other components of blood" Nieto-Aristiza´bal Iet al., (2020) & Altobelli et al., (2023).

Unfortunately, plasmapheresis is associated with diverse adverse effects that could be even mortal. The serious complications include hypotension, shock, hemolysis, and arrhythmias. Comparatively examples of minor consequenses are: abnormal pulse rate, lower limb pain, a sensation of cold/ or paresthesias, fever, allergic reactions, insertion site bleeding or hematoma, abdominal pain, eyelid tremor and anxiety/ or agitation need sedation. Additionally, deviant laboratory test results include leukocytopenia, anemia, thrombocytopenia, hyponatremia, hypokalemia, and hypocalcemia. Szczeklik et al., (2013).

In terms of nursing practice, this therapy approach is somewhat new. It calls for a unique combination of technical and well informed abilities. Every nurse must be skilled and certified to conduct the treatments they do on a daily basis. According to Padmanabhan et al ., (2019), the nurse plays a crucial role in plasmapheresis in a variety of clinical, educational and advisory capabilities. Establishing, sustaining and improving the standard of nursing care for patients undergoing plasmapheresis are the primary responsibilities of nurses Gómez et al., (2021).

The concept of "patients' need" is dynamic and broad, evolving over time and as an illness progresses. It also depends on the patients' cultural traditions and spiritual development. Litterini & Wilson (2022). Therefore, the clinical nurse's role is to give patients undergoing plasmapheresis individualized, humanistic, and all-encompassing nursing care. To guarantee that patients receive the right care, knowledge, and skills, nurses responsible for plasmapheresis in clinical practice must be able to create and maintain evidence-based nursing services and collaborate with the multidisciplinary team. Sargent& Ashurst. (2021).

Because they are in charge of the patient's guidance, coordination, counseling, education, and involvement in clinical research, nurses play a critical role in the care of patients receiving plasmapheresis. Nurses are responsible for the ongoing assessment of patients' parameters during plasmapheresis procedures, which include physical examinations, assessments prior to the initial plasmapheresis session and throughout each session, and the interpretation and analysis of laboratory test findings. Ahmed & Elderiny., (2020) & Ahmed et al., (2022). The nurse's clinical duties include adhering to quality assurance standards in order to provide high quality healthcare services, as well as helping the patient understand information, keeping the environment safe, and providing necessary care within the parameters of the nursing process. Ahmed & Elderiny.,(2020).

Few studies have examined the impact of nursing guidelines on reducing adverse events of plasmapheresis among patients with autoimmune diseases, despite the fact that nurses are in charge of providing care for patients undergoing the procedure and guaranteeing better health outcomes throughout it.

Aim of the Study

The present study aimed to:

Investigate the effect of nursing guidelines on controlling adverse events of plasmapheresis among patients with autoimmune diseases.

Research hypothesis:

Patients with autoimmune diseases who receive nursing guidelines will experience significant reduction in adverse events of plasmapheresis than those who don't receive it.

Materials and Method

Materials

Research design:

For conducting this study, a quasi-experimental research design was used.

Setting:

The study was carried out at The Main University Hospital's Hemodialysis Unit in Alexandria, Egypt.

Subjects:

From the previously mentioned setting, a convenient sample of 60 patients with autoimmune diseases scheduled for plasmapheresis procedures was selected, and they were randomly assigned to two equal groups (30 patients each): the study group received nursing guidelines, while the control group received only routine medical treatment at the hospital.

Sample size calculation:

The study targeted patients undergoing plasmapheresis and utilized the G*Power software (version 3.1.9.7) for sample size estimation. The parameters set for the analysis included a power (1 - β error probability) of 0.95, an effect size of 0.25, an alpha (α error probability) of 0.05, and two groups for comparison, along with references to previous studies .Considering a projected dropout rate of approximately 20%, the software calculated the minimum required sample size as 30 patients for each group (study &control), resulting in 60 participants needed to achieve the desired statistical power while accounting for potential attrition .

The following were the requirements for patient inclusion:

1. Adult patients aged 20 to 60 years, both male and female.

2. Patients who have been diagnosed with autoimmune diseases, such as autoimmune hemolytic anemia, chronic inflammatory demyelinating polyneuropathy, Guillain Barre Syndrome, and Myasthenia Gravis (MG).

3. At least five scheduled sessions of plasmapheresis.

Tools of the study:

In order to conduct the study, two tools were utilized for data collection.

Tool I: Biosociodemographic Characteristics structured interview schedule: The researchers created it after reviewing recent pertinent literature to learn more about the biosociodemographic characteristics of the patients under study. Ahmed & Elderiny.,(2020) , Dinse et al., (2022) & Frederick.,(2023). It was divided into the following two sections:

Part I: Patients' sociodemographic characteristics: The patient's sociodemographic information, including age, gender, place of residence, marital status, educational attainment, and occupation, was gathered in this section.

Part II: Patients' clinical data: This section was used to collect data regarding the clinical history of the patients such as; family history, patient's diagnosis, time since treatment with plasmapheresis onset, number of plasmapheresis sessions, associated medical disease, and medications.

Tool II: Plasmapheresis adverse events observational checklist:

It was adapted from Hamza et al., (2019) and was used to evaluate how frequently adverse events occurred pre and post nursing guidelines' application. This tool comprised various adverse events of plasmapheresis marked either (yes) if present or (no) otherwise. Hypotension, bruising or swelling at the site of needle insertion, extreme itching or rash, nausea and/or vomiting, fatigue, fever, dyspnea, abdominal colic, dizziness, numbness around the mouth and limbs, coldness, joint discomfort, and cramping were among the adverse events.

Scoring system:

If present, each adverse event occurrence received a score of (one), whereas if absent, it received a score of (zero). After that, the overall score was computed and transformed into percentage and numerical scores.

Method:

The study was accomplished as follows:

- After outlining the goal of the study and guaranteeing the privacy, anonymity, and confidentiality of the data gathered, approval was obtained from the Research Ethics Committee, the Dean of the Faculty of Nursing, and the Main University Hospital's Head of the Hemodialysis Department.
- Following an explanation of the study's purpose, the directors of the nursing services department and hospital administrative staff in the selected location granted formal written consent to perform the study.
- The researcher created tool I after reviewing recent, pertinent literature, while tool II was adapted from Hamza et al 2019.
- A panel of five experts in the fields of Medical Surgical Nursing and Hemodialysis reviewed the study's instruments to ensure that they were complete, clear, and had content validity. The required modifications were done thereafter.
- The Cronbach's Alpha test was used to evaluate the tools' reliability and assess their internal consistency, which measures how well the instruments consistently measure what they were intended to measure.
- The researcher conducted a pilot study on six patients to evaluate the tools' applicability and clarity as well as to pinpoint any potential application challenges. They were excluded from the study's sample.

Data collection:

Data collection began at the end of March 2024 and lasted for ten months, ending at the end of January 2025. The following four phases were used to carry out the study:

Phase I: Assessment phase:

- Prior to the nursing guidelines' implementation, a preliminary assessment of all patients (both study and control group) was conducted using tools I and II to gather baseline patient data and medical health history, assessing existing adverse events preceded to the planning for developing the nursing guidelines that will be designed to control the possible adverse events of plasmapheresis procedure.

Phase II: Planning and development phase:

- Following patients' assessment, the nursing guidelines were formulated based on reviewing relevant literature's and the identified patients' needs.
- The researchers developed an educational booklet for study group patients in simple Arabic language and supplemented by photos. It was consisted of two parts; the first part consisted of a brief base of knowledge about plasmapheresis procedure and the second part which comprised the group of adverse events supplied with the specific nursing guidelines for each one of them including general health instructions. This illustrative booklet was used as guide only for the study group of patients.

Phase III: Implementation phase:

For the study group:

- The designed nursing guidelines to control adverse events of plasmapheresis procedure were implemented only to patients of the study group. The patients' interviews and follow up was accomplished at the Main University Hospital's Hemodialysis unit.
- It was conducted in 2 sessions. The first session was carried out during patient preparatory visit 2 days before undergoing plasmapheresis procedure. While, the second session was carried out at the day of undergoing plasmapheresis procedure, through the following:-

The first session contents included the following:

- Establishing therapeutic relationship with patients and specifying the objective of the research.
- Providing theoretical basic general information about the plasmapheresis procedure (definition, purpose, indications, contraindications and possible adverse events).
- Explaining and giving health education and instructions to patients about pre procedure

preparation guidelines that will be followed during the 2 days before undergoing plasmapheresis procedure. This was accomplished using the designed booklet.

*** The second session included:**

- The patient's clinical status was monitored actually to detect intra- and post-procedure adverse events of plasmapheresis procedure.
- Complete physical assessment of patients was conducted by the researchers and the vital parameters were assessed including monitoring of vital signs, patients' skin assessment for possible rash or erythema and musculoskeletal as well as GIT assessment.
- The complaints reported by patients, clinical symptoms observed, and procedure-related adverse events were recorded.
- The researchers demonstrated the recognized nursing guidelines to control adverse events during and immediately after the procedure. Furthermore, the patients displayed health-related guidelines while being supervised by the researchers and guided by the illustrated booklet.
- Patients were instructed to continue following the same instructions of plasmapheresis guidelines during the 2 consecutive days before undergoing the next scheduled second and third plasmapheresis session.

For the control group:

- The patients of this group did not receive the nursing guidelines during the time of the study, and they were subjected to only the routine hospital care (taking medications only according to adverse events). Those patients of the control group were assessed by the researchers regularly throughout the data collection process.

Phase IV: Evaluation phase:

- Evaluation was carried out for both study and control group to evaluate their health outcomes regarding presence of adverse events.
- Evaluation of the effect of nursing guidelines was conducted to evaluate its effectiveness on controlling adverse events of plasmapheresis for patients of the study group.
- During the following two consecutive planned plasmapheresis sessions (the second and third sessions), the researchers used tool II to assess patients in both the study and control groups.
- The patients underwent physical evaluations and were observed while undergoing plasmapheresis treatment and after finishing the plasmapheresis session.

Ethical considerations:

- The research ethics committee of Alexandria University's faculty of nursing officially approved conduction of the study.
- All of the patients who were being studied were informed of the study's aim, and their consent and readiness to participate were first sought.
- In order to participate in the study, all patients received assurances regarding their privacy and the confidentiality of their data.
- The patients who were enrolled were made aware that they might leave the study at any moment and that participation is completely voluntary.

Statistical analysis of the data

- IBM SPSS software package version 26.0 was used to examine the data that was fed into the computer. The mean and standard deviation were used to describe quantitative data. At the 5% level, the results' significance was assessed.

The used tests were

1- Chi-square test

Comparing various groupings for categorical variables.

2- Student t-test

Comparing two groups under study for quantitative variables that are normally distributed

3- ANOVA with repeated measures

To compare more than two periods or stages for quantitative variables that are normally distributed and the Post Hoc test (Bonferroni adjusted) for pairwise comparisons.

Results

Table 1: Shows comparison between Patients in the Study and Control Group According to Socio-demographic Characteristics. In relation to the mean age of the study group it ranges (37.9±8.8), compared to (39.3±9.3) for the control group patients. The majority of patients in the study and control groups had secondary educational level (50.0% & 33.3% respectively), were married (60.0% & 56.7% respectively), unemployed (43.3% & 46.7% respectively) and of rural residence (73.3% in both groups) , with no statistical significant differences were detected between both groups. As regards gender, it revealed that (53.3%) of patients in the study group were male, whereas in the control group the same percentage were female patients with no statistical significant difference.

Table (2): Presents comparison between the study and control groups of patients regarding clinical data. The table reveals that (40.0%) of patients in the study group had diabetes mellitus and (40.0%) of patients in the control group did not have any associated medical disorders, and no statistically significant differences were found between the two groups with respect to associated medical diseases (p = 0.180). Furthermore in both the study and control groups of patients had no family history and the most commonly reported diagnosis was Guillian Barre Syndrome (70.0% and 73.3% respectively). No statistically significant differences were found between the two groups with respect to family history and patient's diagnosis where (p= 1.000). Regarding the onset of plasmapheresis treatment and duration of disease, the highest percentages of patients in both the study and control groups were 2 to less than 5 years (63.3 % and 60.0 %) respectively with no statistically significant differences were observed between both groups where (p= 1.000). In terms of number of plasmapheresis sessions, it can be noticed that about two thirds of patients in both the study and control groups had less than 10 sessions (66.7 % and 63.3 %) respectively with no statistical significant difference between them (p = 0.787).

Table (3): Demonstrates comparison between the study and control groups of patients in relation to adverse events of plasmapheresis. It was noted that during the first observation, the majority of patients in both the study and control groups reported having adverse events related to plasmapheresis such as dyspnea, nausea & vomiting, fatigue, joint pain & cramps, drowsiness and insertion site bruises & swelling (76.7% & 80.0%), (73.3% & 70.0%), (76.7% & 83.3%), (90.0%), (90.0% & 80.0%) and (63.3% & 70.0%) respectively. No statistically significant differences were observed between the study and control groups in the assessment before applying nursing guidelines. Moreover, it revealed that during the second and third observations of patients, highly statistically significant differences were observed between the study and control groups after applying nursing guidelines. The study group's patients reported significant decrease in adverse events of plasmapheresis such as dyspnea (56.7% & 33.3%) during the second and third observations respectively compared to (73.3% & 86.6%) in the control group's patients, where (p = <0.001). During the second observation, statistically significant differences between both groups of the study were detected as regards nausea & vomiting, fatigue, joint pain & cramps, rash & itching and insertion site swelling, where p = (0.004, 0.007, <0.001, <0.001 & <0.001) respectively. The same results were confirmed during the third observation in addition to statistically significant differences between both groups of the study were noticed regarding hypotension and abdominal colic where (p = <0.001 & 0.007) respectively.

Table (4): Shows comparison between the study and control groups of patients in relation to total score of plasmapheresis adverse events throughout three observations. The table illustrates that there were highly statistical significant differences between patients in both groups of the study in the total score throughout three times of observations. Regarding the mean total score in the second

observation of patients in the study group was (3.4±1.0) compared to (11.2±2.1) in the control group where (p = <0.001). Furthermore, the mean total score in the third observation of patients in the study group was (2.8±3.6) compared to (10.7±1.5) in the control group where (p = <0.001).

Table (1): Comparison between Patients in the Study and Control Group According to Socio-demographic Characteristics.

Patient's socio-demographic data	Study (n=30)		Control (n=30)		χ^2	p
	No.	%	No.	%		
Age						
20- <30	7	23.3%	5	16.7%		
30- <40	11	36.7%	10	33.3%	0.840	0.910
40- <50	8	26.7%	9	30.0%		
50 - 60	4	13.3%	6	20.0%		
Mean ±SD	37.9±8.8		39.3±9.3		t= 0.598	0.552
Gender						
Male	16	53.3%	14	46.7%	0.267	0.606
Female	14	46.7%	16	53.3%		
Educational level						
Illiterate	5	16.7%	6	20.0%		
Primary	8	26.7%	10	33.3%		
Secondary	15	50.0%	10	33.3%	2.004	0.605
Bachelor	2	6.7%	4	13.3%		
Marital status						
Single	8	26.7%	9	30.0%		
Married	18	60.0%	17	56.7%		
Widow	2	6.7%	2	6.7%	0.366	1.000
Divorced	2	6.7%	2	6.7%		
Occupation						
Unemployed	13	43.3%	14	46.7%		
Manual work	9	30.0%	8	26.7%	0.096	0.953
Sedentary work	8	26.7%	8	26.7%		
Residence						
Rural	22	73.3%	22	73.3%	0.0	1.000
Urban	8	26.7%	8	26.7%		

χ^2: Chi square test
t: Student t-test

Table (2): Comparison between the Study and Control Groups of Patients Regarding Clinical Data.

Patient's clinical data	Study (n=30)		Control (n=30)		χ^2	p
	No.	%	No.	%		
Associated diseases						
Hypertension	6	20.0%	10	33.3%		
Diabetes Mellitus	12	40.0%	8	26.7%		
Cardiac disease	3	10.0%	0	0.0%	4.805	0.180
No Associated Disease	9	30.0%	12	40.0%		
Family history						
Yes	9	30.0%	9	30.0%	0.0	1.000
No	21	70.0%	21	70.0%		
Patient's diagnosis						
Guillain-Barre syndrome	22	73.3%	22	73.3%		
Myasthenia gravis	2	6.7%	2	6.7%	0.313	1.000
Multiple sclerosis	4	13.3%	4	13.3%		
Thrombocytopenia	2	6.7%	2	6.7%		
Time since treatment with plasmapheresis onset						
<1 year	10	33.3%	10	33.3%		
2-< 5	19	63.3%	18	60.0%	0.468	1.000
5 and more	1	3.3%	2	6.7%		
Number of plasmapheresis sessions						
<10	20	66.7%	19	63.3%	0.073	0.787
≥10	10	33.3%	11	36.7%		
Mean ±SD	8.6±2.1		8.1±2.1		t=0.231	0.818
Duration of disease						
<1 year	10	33.3%	10	33.3%		
2-< 5	19	63.3%	18	60.0%	0.468	1.000
5 and more	1	3.3%	2	6.7%		
Medications used						
Anti-hypertensives	6	20.0%	10	33.3%		
Antidiabetic medications	12	40.0%	8	26.7%		
cardiac medications	3	10.0%	0	0.0%	4.805	0.180
Corticosteroids	9	30.0%	12	40.0%		

χ^2: Chi square test
t: Student t-test

Table (3): Comparison between the Study and Control Groups of Patients in Relation to Adverse Events of Plasmapheresis

Adverse events	1st observation						2nd observation						3rd observation					
	Study (n=30)		Control (n=30)		χ^2	p	Study (n=30)		Control (n=30)		χ^2	p	Study (n=30)		Control (n=30)		χ^2	p
	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
1- Hypotension	17	56.7%	15	50.0%	2.593	0.321	12	40.0%	18	60.0%	1.288	0.137	8	26.7%	24	80.0%	17.143*	<0.001*
2- Dyspnea	23	76.7%	24	80.0%	3.774	0.549	17	56.7%	22	73.3%	0.800	0.371	10	33.3%	26	86.6%	15.176*	<0.001*
3- Fever	10	33.3%	12	40.0%	0.287	0.592	10	33.3%	12	40.0%	1.409	0.287	8	26.7%	12	40.0%	2.882	0.332
4- Nausea & Vomiting	22	73.3%	21	70.0%	0.082	0.774	15	50.0%	21	70.0%	10.300	0.004*	11	36.7%	21	70.0%	11.279*	0.001*
5- Abdominal colic	11	36.7%	12	40.0%	0.622	0.145	3	10.0%	12	40.0%	7.200*	0.007*	3	10.0%	12	40.0%	7.200*	0.007*
6- Fatigue	23	76.7%	25	83.3%	1.920	0.166	17	56.7%	27	90.0%	18.523*	<0.001*	11	36.7%	27	90.0%	8.523*	0.004*
7- Joint pain and cramps	27	90.0%	27	90.0%	1.373	0.928	9	30.0%	25	83.3%	20.000*	<0.001*	9	30.0%	26	86.6%	18.800*	<0.001*
8- Numbness of limbs	5	16.7%	6	20.0%	2.093	0.332	5	16.7%	7	23.3%	2.091	0.642	5	16.7%	8	26.7%	2.411	0.532
9- Drowsiness	27	90.0%	24	80.0%	2.857	0.791	17	56.7%	22	73.3%	0.800	0.371	17	56.7%	21	70.0%	1.148	0.284
10- Rash & itching	9	30.0%	12	40.0%	0.659	0.417	0	0.0%	12	40.0%	15.00*	<0.001*	3	10.0%	15	50.0%	13.750*	0.003*
11- Insertion site bruises & swelling	19	63.3%	21	70.0%	3.750	0. 503	16	53.3%	24	80.0%	21.600*	<0.001*	6	20.0%	24	80.0%	21.600*	<0.001*

χ^2: Chi square test *: Statistically significant at $p \leq 0.05$

Table (4): Comparison between the Study and Control Groups of Patients in Relation to Total score of Plasmapheresis Adverse Events throughout the three Observations

Total score	Study (n=30) Mean ± SD	Control (n=30) Mean ± SD	t	P
1st observation	11.7±2.6	11.4±2.0	2.787	0.347
2nd observation	3.4±1.0	11.2±2.1	**10.655***	**<0.001***
3rd observation	2.8±3.6	10.7±1.5	**19.205***	**<0.001***
F (p)	**95.448* (<0.001*)**	**12.429* (<0.001*)**		
P1	**<0.001***	0.249		
P2	**<0.001***	0.835		
P3	**0.001***	2.346		

t: Student t-test for comparing between the two groups
F: F test (ANOVA) with repeated measures, Sig. bet. periods was done using Post Hoc Test (adjusted Bonferroni)
P1: for comparing between 1st and 2nd observation
P2: for comparing between 1st and 3rd observation
P3: for comparing between 2nd and 3rd observation
*: Statistically significant at $p \leq 0.05$

Discussion

Therapeutic Plasmapheresis (TP) is the treatment of choice for several conditions such as renal, hematological, neurological, metabolic, dermatologic, rheumatologic and autoimmune diseases. When a component of plasma, like immunoglobulin, is extremely dangerous and can be effectively removed, it can be employed as a therapeutic management in this many illnesses. Faria, R. et al., (2021).

A nurse plays a vital role in plasmapheresis in a number of ways, including clinical, instructional, investigative, and advising. Establishing, upholding, and enhancing nursing care standards for patients undergoing plasmapheresis are the primary responsibilities of nurses. Gómez F, et al., (2021). A very new aspect of nursing practice is this kind of care. It calls for a specific set of technical abilities and specialized knowledge. Every nurse must possess the necessary credentials and training for the treatments they frequently carry out. Padmanabhan et al., (2019) The present study aims to evaluate the effect of nursing guidelines on controlling adverse events of plasmapheresis among patients with autoimmune diseases.

Regarding socio-demographic and clinical findings, current study results revealed that the ratio of the studied participants were nearly equal in gender, during the middle age which ranged from 30 to 40 years old, living in rural area, suffering from diabetes mellitus, diagnosed with Guillain-Barre syndrome (GBS) since two to five years ago with negative family history and received less than ten plasmapheresis sessions. This goes hand in hand with Ahmed & Elderiny (2020) findings, who reported that most of studied patients were in the fourth decades, males, furthermost of participants were married, illiterate and the farthest were living in rural areas.

Despite the fact that most of the patients in the study had a diagnosis of Myasthenia Gravis (MG), the average number of plasmapheresis treatments was roughly seven, according to Ahmed & Elderiny (2020) While In a quasi-experimental study conducted at Mansoura University Hospitals in Dakahlia, Egypt, by Hamza et al., (2019) assessed the effectiveness of the Guideline for Patients Undergoing Plasmapheresis Outcomes and discovered that the patients' ages fell between the range of 44.99 ± 8.90 years. Three quarters of them were married, and the male to female ratio was equal. More than half of the patients in the study were from urban areas, and slightly fewer than half had a secondary or university education. They also reported that Myasthenia Gravis (MG) is the most commonly diagnosed condition, followed by Gallian Barrie syndrome (GBS). They also mentioned that a higher percentage of the studied sample was

made up of people with hypertension and diabetes mellitus than other common associated diseases.

Additionally, the results of this study are consistent with the 2019 guidelines published by the American Society for Apheresis (ASFA), which recognized Gallian Barrie syndrome (GBS) as one of the disorders of interest and provided specific recommendations for the use of therapeutic plasmapheresis. However, Gwathmey et al., (2011) claimed that 44% of cases where TPE is recommended are known to be related to neurological problems in general. Furthermore, the majority of patients were female, the median age at admission was 50, the median number of TPEs per patient was five, and the patients were diagnosed with GBS, according to Aristiza´bal et al., (2020)

Concerning the adverse effects of plasmapheresis among the studied patients, it was found that the majority of patients in both the study and control groups reported having hypotension, dyspnea, nausea & vomiting, fatigue, joint pain & cramps, drowsiness and insertion site bruises & swelling in assessment during the first observation. Similar to the results of this study, Aristiza´bal et al ., (2020) found that while severe adverse reactions like hypersensibility reactions and arrhythmias were less common, hypotension, electrolyte imbalances, and infections were the most common adverse events that occurred after TP was administered. Additionally, Clarck et al., (2015) noticed that 59 of their patients needed at least one electrolyte replacement following TPE, mainly because of deviations in potassium and magnesium. In parallel, Hamza et al., (2019) found that hypotension and dyspnea were the most often reported consequences. The frequency of hypotension was higher, according to a study carried out by Karaca et al., (2014). Vasovagal episodes, hypo-oncotic fluid replacement, and delayed or insufficient volume replacement are all indicators of hypotension. Moreover, additional research by Tombak et al., (2016) revealed that the most frequent adverse events following plasmapheresis were anemia and hypocalcemia.

One of the study's most notable findings is that patients undergoing plasmapheresis benefited from the guidelines' implementation, as the experimental group's mean score on the plasmapheresis adverse events observational checklist significantly decreased, primarily after the second and third observations. This is consistent with the findings of Ahmed & Elderiny (2020) who compared the groups under study based on the mean values of plasmapheresis-related problems before and after the instructional package. It is evident that the study group reported a statistically significant decrease in problems related to plasmapheresis as compared to the control group. Furthermore, because the control group received no intervention, there was no statistically significant change in the number of adverse events reported by them at the post-implementation of the educational package. On the same hand, Hamza et al. , (2019) found that application of guidelines for patients undergoing plasmapheresis had significantly improved patient's outcomes in term of less adverse events and complications.

Current evidence highlights that applying nursing guidelines helps to control adverse events of plasmapheresis among patients with autoimmune diseases. Which goes hand in hand with Falck & Heitz., (2018) who stated that “the professional practice and adherence to standardized guideline can optimize the success of plasmapheresis procedure and minimize symptoms, adverse reactions, side effects, risks, and complications” And added “It is worth noting that the risks and complications associated with TP can be greatly mitigated by highly experienced and skilled staff”

Conclusion

Based on the findings of the current study, it can be concluded that, when compared to the control group, the majority of patients in the study group had a statistical significant improvement in the total mean scores during the second and third observation of plasmapheresis related adverse events after applying the nursing guidelines.

Recommendations

Based on the study results, the following recommendations are suggested:

Replication of the current study on large probability sample.

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