The Professional Medical Journal
www.theprofesional.com

DOI: 10.17957/TPMJ/17.3727

ORIGINAL PROF-3727

PLASMAPHERESIS;
AN EXPERIENCE IN BLOOD BANK OF A TERTIARY CARE HOSPITAL IN PESHAWAR

Hamida Qureshi[1], Hamzullah khan[2]

1. MBBS, FCPS
Associate Professor Haematology
Department of Hematology
Nowshera Medical College,
Nowshera.
2. MBBS, DCH (Pak), MPH (Pak)
M.Phil-Haematology (Pak)
Assistant Professor Haematology
Nowshera Medical College,
Nowshera.

Correspondence Address:
Dr. Hamzullah Khan
Assistant Professor Haematology
Nowshera Medical College,
Nowshera.
hamzakmc@gmail.com

Article received on:
15/11/2016
Accepted for publication:
20/04/2017
Received after proof reading:
05/06/2017

ABSTRACT... Objectives: To determine the frequency of major indications require plasmapheresis in blood bank of Lady Reading Hospital Peshawar. **Study Design:** Cross sectional study. **Setting:** Blood bank of Lady Reading Hospital Peshawar. **Period:** June 2010 to June 2012. **Material and methods:** Relevant information's were recorded on a pre-designed questionnaire prepared in accordance with the objectives of the study. **Results:** A total of 54 patients were enrolled in the trial. 23 (42.59%) were females, and 31(57.41%) were males. Males to females ration was 1.4:1. We received patients for plasmaphersis in age ranging from 15 to 74 years. Majority were young patients in age range 15 to 34 years age. We received majority of the patients for the subject procedure from ICU (Intensive care unit) 20(73%), followed by cardiothoracic unit 17(31.48%). We also receive two volunteers during study. The frequency of various indications for plasmapheresis were; myasthenia gravis 29(53.7%), Guillen barre syndrome 20(37.04%) and thrombocytopenic purpura 3(5.56%). **Conclusion.** From this study we concluded that that autoimmune diseases are common in younger age which is a very serious concern for our society. Plasmapheresis is a therapeutic procedure as well and patients with autoimmune disorders get relieved with it symptomatically as autoimmune antibodies are removed. Myasthenia gravis was counted as major disease followed by GBS and thrombocytopenic purpura in our population.

Key words: Autoimmune disorders, Plasmapheresis, Peshawar.

Article Citation: Qureshi H, Khan H. Plasmapheresis; an experience in blood bank of a tertiary care hospital in Peshawar. Professional Med J 2017;24(6):855-858.
DOI: 10.17957/TPMJ/17.3727

INTRODUCTION

Plasmapheres Refers to a wide range of procedures that involves extracorporeal separation of blood components that results in a filtrated plasma product that can be used for therapeutic purposes.[1] Centrifugation of whole blood is done to segregate various blood products depending on their gravity, such as red cells (RBCs), Leukocytes (WBCs), platelets, and plasma.[2] In therapeutic plasmapheresis, automated centrifuge is used in which filtered plasma is removed and discarded and red blood cells along with colloid such as donor plasma or albumin is returned to the patient again in continous cycle. Plasma exchange is currently used for therapeutic purposes in many immunological disorders.[3]

Plasmapheresis generally is used when a toxic substance in the plasma, such as immunoglobulin, need to be effectively removed. Many well known inmmunological disorders that need plasmaphersis (including neurological disease MG, GBS etc, hematological disorders TTP, metabolic (Wilson disease), rheumatologic, dermatologic, renal diseases, and intoxications.[3,4]

There are many life style modifying disorders that require plasmapheresis as first-line therapy, or in conjunction with other treatment options (like thymectomy and use of steroids in many, or cytotoxic drugs) are as follows: Guillain-Barre syndrome (GBS), Myasthenia gravis (MG), Thrombotic thrombocytopenic purpura (TTP) Hyperviscosity syndromes and Wilson disease etc.[5]

Present study was conducted to determine the frequency of major indications require plasmapheresis in blood bank of Lady Reading

Hospital Peshawar.

MATERIAL AND METHODS

Design of study
Cross sectional study.

Duration
From June 2010 to June 2012.

Setting
Blood bank of Lady Reading Hospital Peshawar

Procedure
Informed consent was taken from all patients. Central venous catheter was passed vein in subclavian in minor operation theater under aseptic condition. Hemonotic apheresis machine was used. Disposable adult plasmapheresis kit used. Approximately 1000-1800 plasmapheresis removed from patients removed depending upon the clinical improvement of patients. The catheter was kept in place for one week time for further procedure if needed. The procedure used to be repeated in the same intravenous line after post operative cases of myasthenia gravis patients for clinical improvements. In GBS Patients plasmapheresis was indicated repeatedly as per patients need and clinical improvement.

During the procedure, patients or donors rest on a cot. A catheter or needle is placed into a vein in the arm, groin etc that has the robust artery. For replacement or return of plasma back into the body a second tube/catheter is placed in the arm or foot.

Procedure lasts between one and three hours time. Patients usually need up to five cycles a week depending on condition of patients and severity of the disease. Treatment option and no of cycle of plasmapheresis vary widely from disease to disease and on person's overall health.

Inclusion criteria
All patients irrespective of age and sex referred from various clinical units for plasmapheresis were included in the trial.

Exclusion
The exclusion criteria were: Patients who cannot tolerate central line insertions, septic patients who are hemodynamically not stable, patients who are allergic to fresh frozen plasma or its products including albumin, patients having allergy to heparin, patients using angiotensin-converting enzyme (ACE) inhibitors need to stop taking the medication for 24hrs at least before plasma exchange.

Data analysis
Data was entered in the MS Excel 2010 and analyzed. There were two types of variables. One demographic variables including age, address, gender etc while data variables were types of immunological diseases, clinical improvement, number of sessions etc.

RESULTS
A total of 54 patients were enrolled in the trial. 23 (42.59%) were females, and 31(57.41%) were males. Males to females ration was 1.4:1 (Table-I). We received patients for plasmaphersis in age ranging from 15 to 74 years. Majority were young patients in age range 15 to 34 years age (Table-II).

Year's wise data of patients received for plasmapheresis are mentioned in Table-III. We received majority of the patients for the subject procedure from ICU (Intensive care unit) 20(73%), followed by cardiothoracic unit 17(31.48%). We also receive two volunteers during study (Table-IV).

The frequency of various indications for plasmapheresis were; myasthenia gravis 29(53.7%), Guillen barre syndrome 20(37.04%) and thrombocytopenic purpura 3(5.56%) (Table-V).

Gender of patients	Total	Percentage
Female	23	42.59
Male	31	57.41
Grand Total	54	

Table-I. Genderwise distribution of patients.

Age Range	No of patients	Percentage
15-24	14	25.93
25-34	15	27.78
35-44	10	18.52
45-54	8	14.81
55-64	4	7.41
65-74	3	5.56
Grand Total	54	

Table-II. Age wise distribution of patients.

Year	Total	Percentage
2010	20	37.04
2011	23	42.59
2012	11	20.37
Grand Total	54	

Table-III. Yearly data of patients.

Name of Referring unit	Total	Percentage
Cardiothoracic	17	31.48
Gynecology	3	5.56
ICU (Intensive care unit)	20	37.04
Medical ward	7	12.96
Nephrology	1	1.85
Neurology	4	7.41
Volunteer	2	3.70
Grand Total	54	

Table-IV. Referring units of patients for Plasmapheresis.

Type of disease	Total	Percentage
Donated/Volunteers	2	3.70
GBS	20	37.04
MG	29	53.70
TTP	3	5.56
Grand Total	54	

Table–V. Frequency of clinical conditions needs plasmapheresis.

DISCUSSION

Plasmapheresis is a procedure used for therapeutic purposes that involves separation of plasma from the patients that ultimately removes the toxic substances and hazardous immunoglobulins from the patients. In advance countries including United States the plasmapheresis involves automated centrifuge.[6] In our study 23 (42.59%) were females, and 31(57.41%) were males. Males to female's ratio was 1.4:1. Regarding the age wise distribution of various immunological disorders need plasmapheresis, males are more affected than females. Another study reported that out of 51 cases that they studied, 60% were males and 40%females.[7] In another study out of 26 cases of Mysthenia Gravis who underwent plasmapheresis:, 19 women and seven men. The mean age for onset of MG was 28 years, with minimum of 11 and maximum of 69 years.[8] The frequency of various indications for plasmapheresis were; myasthenia gravis 29(53.7%), Guillen barre syndrome 20(37.04%) and thrombocytopenic purpura 3(5.56%). Another study reported that plasmapheresis done for various diseases in the following order of frequencies i.e. myasthenia gravis (33.3%), Guillain-Barre syndrome (14%), Systemic lupus erythematosus (SLE) (7.4%), Lyell's syndrome (9.3%) and (TTP) thrombotic thromcytopenic purpura (7.4%).[9] Another study reported that the most common indications for plasmaphersis in their study were neurological disorders ($n = 13$), comprised of Guillain–Barré syndrome GBS (n = 10) and myasthenia gravis MG ($N = 3$), ten cases of Hematological disorders where plasmapheresis conducted for therapeutic purposes were thrombotic thrombocytopenic purpura (TTP)-hemolytic uremic syndrome (HUS) etc.[10] Mysthenia gravis was main disease noted in our study. These were the patients who were admitted for thymectomy in the cardiothoracic unit. Plasmapheresis was advised in pre and post operative cases. Plasmapheresis in the Mysthenia gravis has debatable role because of considerable differences in the volume of plasma removed in the procedure, number of sessions required to satisfy patient clinical improvement, and amount of concomitant immunosuppressive drug therapy. Many authors prefer immunosuppressive therapy over the plasmapheresis. Its of use only in short term and acute cases as intervention for MG. Plasmapheresis just temporarily improve the clinical condiction and helps reduction in titer of antibody to acetylcholine receptor that helps patient for short term only.[9-10] However plasmapheresis is an effective treatment option for many patients with severe generalized MG who are resistant to immunological drugs or other types of treatments.

Guillain-Barre syndrome was the second most important indication for plasmapheresis in our

study. Plasmapheresis has been successfully used in the treatment of pediatric cases with Guillain-Barré syndrome (GBS). Plasmapheresis has established its role as effective treatment option in in severe acute cases of inflammatory demyelinating polyneuropathy (AIDP) and Guillain-Barré syndrome (GBS). Again its role is mediated only for short-term management.[11]

We received patients with Thrombotic thrombocytopenia as third on frequency order for thrombocytopenia. Another study on role of plasmapheresis in TTP reported that 7 out 8 patients with TTP who were treated plasmapheresis achieved complete remission and recovered.[12]

From this study we concluded that that autoimmune diseases are common in younger age which is a very serious concern for our society. Plasmapheresis is a therapeutic procedure as well and patients with autoimmune disorders get relieved with it symptomatically as autoimmune antibodies are removed. Myasthenia gravis was counted as major disease followed by GBS and thrombocytopenic purpura in our population.

REFERENCES

1. Kaplan AA. **Therapeutic plasma exchange: core curriculum 2008.** *Am J Kidney Dis*. 2008 Dec. 52(6):1180-96.
2. Schwartz J, Padmanabhan A, Aqui N, Balogun RA, Connelly-Smith L, Delaney M, et al. **Guidelines on the Use of Therapeutic Apheresis in Clinical Practice-Evidence-Based Approach from the Writing Committee of the American Society for Apheresis: The Seventh Special Issue.** *J Clin Apher*. 2016 Jun. 31 (3):149-62.
3. Malchesky PS. **Therapeutic Apheresis: Why? *Ther Apher Dial*.** 2015 Oct. 19 (5):417-26.
4. Siami GA, Siami FS. **Membrane plasmapheresis in the United States: a review over the last 20 years.** *Ther Apher*. 2001 Aug. 5(4):315-20.
5. Pham HP, Schwartz J, Cooling L, Hofmann JC, Kim HC, Morgan S, et al. **Report of the ASFA apheresis registry study on Wilson's disease.** *J Clin Apher*. 2015, 5(4): 55-60.
6. Agishi T, Kaneko I, Hasuo Y, Hayasaka Y, Sanaka T, Ota K, et al. **Double filtration plasmapheresis.** 1980. *Ther Apher*. 2000 Feb. 4(1):29-33.
7. Hernández MR, Cabrera BE, Sosa DA, Rebollo SG, Cabrera ML, Marrero DH, Gonzalez AA, Ramírez TA, Cruz BM, Sellares VL. **Patients treated with plasmapheresis: a case review from University Hospital of the Canary Islands.** Nefrologia. 2011; 31(4):415-34.
8. Jaretzki A III , Barohn RJ, Ernstoff RM, et al. **Myasthenia gravis: recommendations for clinical research standards.** Neurology 2000; 55:16-23.
9. Szczeklik W, Wawrzycka K, Władarczyk A, Sega A. **Complications in patients treated with plasmapheresis in the intensive care unit.** Anaesthesiol Intensive Ther. 2013; 45(1):7-13.
10. Haque A, Sher G, HodA M, Moiz B. **1Feasibility of Pediatric Plasma Apheresis in Intensive Care Settings.** Therapeutic Apheresis and DialysiS 2014; 18(5):497-501.
11. Nomura T, Hamaguchi K, Hosakawa T, et al. **A randomized controlled trial comparing intravenous immunoglobulin and plasmapheresis in Guillain-Barré syndrome.** Neurol Ther 2001; 18: 69–81.
12. RM Bukowski, JW King and JS Hewlett. **Plasmapheresis in the treatment of thrombotic thrombocytopenic purpura.** Blood 1977 50:413-17.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. No.	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Hamida Qureshi	Data collection, Analysis, Article writing	
2	Dr. Hamzullah khan	Data collection, Analysis, Concept writing	