

**Summer Training at
PlasmaGen Biosciences, Bangalore
(16th April 2012-30th May 2012)**

**Plasma Products Therapy and Blood Banking Scene in
India**

**By
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**Under the guidance of
Dr. Seema Mehta**

**Post Graduate Diploma in Pharmaceutical Management
2011-2013**



**Institute of Health Management Research,
Jaipur
2012**

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Certificate

This is to certify that Ojaswi Tiwari has undergone summer training in PlasmaGen Biosciences, Bangalore from 16th April to 9th June, 2012

The candidate carried out all the studies related to summer training herself. Her approach to the studies has been sincere, scientific, and analytical. This summer training in partial fulfillment of the course requirement is recommended for the award of Post Graduate Diploma in Pharmaceutical Management.

I wish her success in all future endeavors.



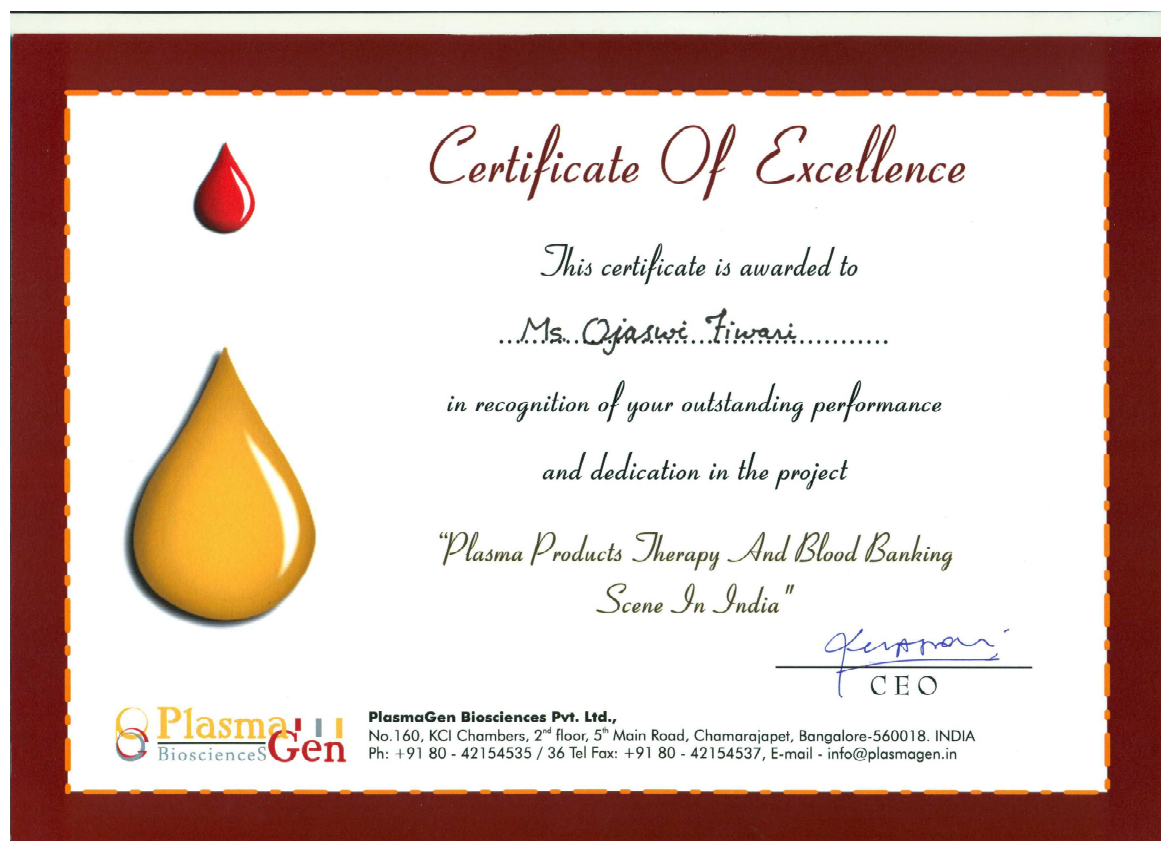
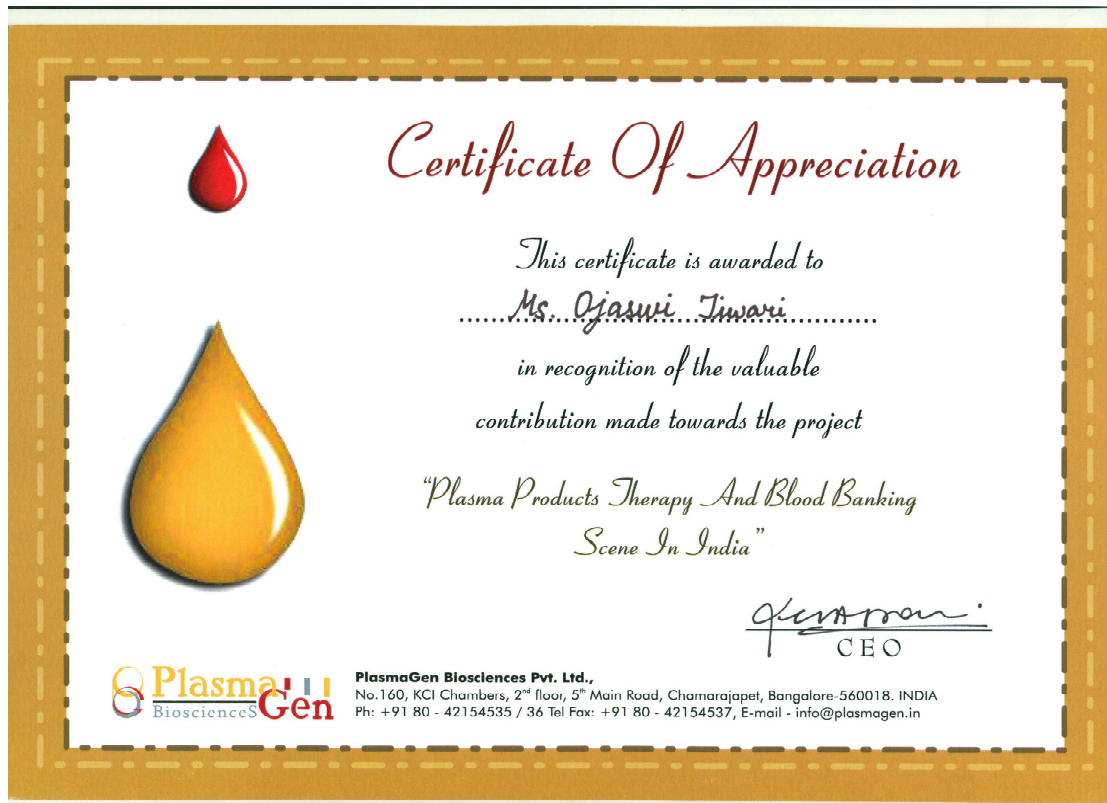
Dr .P. R.Sodani

(Dean Academics and student affairs)



Dr.Seema Mehta

(Assistant Professor)



ACKNOWLEDGEMENT

“Successful passage and outcome of every work comes with dedication, determination and team work. All these turn futile in the absence of visionary guidance.”

I acknowledge and express my heartily gratitude for the help, guidance, co-operation and assistance expanded to me by different individuals.

I shall always be indebted to **Dr. Ranjeet Ajmani** (*CEO, PlasmaGen Biosciences*), **Dr.Amit Jha** (*Product Manager, PlasmaGen Biosciences*) and **Mr. Nipun Garg** (*National Manager, PlasmaGen Biosciences*), for giving me an opportunity to undergo this project and also for their immense contribution towards execution & completion of this project. I would also like to thank **Mr.Rajendra Kumar & Mr.Ajay Kumar Singh** (*ABM of Delhi region*) for their valuable guidance & time during the market research work.

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Last but not least, I would like to thank my parents, friends and all my well-wishers for their support and guidance in the successful completion of the project.

Ojaswi Tiwari

Part I

(Report on Plasma Products Therapy)

EXECUTIVE SUMMARY

The project undertaken is a market research on the demand, consumption pattern & personal preferences of doctors & patients while buying plasma products for medication. The plasma products such as IVIG, Human Albumin, Anti-D, Hepatitis and Tetanus Immunoglobulin are all very expensive in the market because their only source is human blood & blood donors charge a hefty sum for any donation of blood they make. Despite the fact that all plasma products are life saving drugs & the last line of defense for many doctors, many patients refrain from buying it as their price are well beyond the reach of many poor people which form a large percentage of our population. Also because of the fact that plasma products are new in the market, there is not much awareness among doctors & patients regarding their use. Therefore the plasma market is not very suitable for business, because the option of minimization of production costs doesn't hold here.

The purpose of this market research was to determine the obstacles in doing business in Plasma Products market and to draw a perfect reflection of the current plasma market thereby finding new prospects for PlasmaGen Biosciences, a branch of Trigenesis as it sets foot into the plasma market on their own. Throughout the market survey on doctors of reputed hospitals in the northern region of India(Delhi and Noida), I seek to determine the demand, the consumption pattern, personal preferences ,quality & availability of currently available blood & plasma products in the northern region of India.

From all the responses collected from the doctors it was evident that availability of plasma products is not excellent in the northern region. A clear majority of the doctors found that the current price of plasma products was very high. Doctors have unanimously marked that awareness is required for both patients and doctors on plasma products. The doctors choose the plasma products on the basis of availability, quality of the product and price.

The following few pages are a detailed account along with graphical representations of all the responses gathered during the field-work.

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CHAPTER -1 ORGANIZATION PROFILE

PlasmaGen Biosciences Pvt. Ltd. an offshoot of Trigenesis Life sciences situated in Chamarajapet, Bangalore is a pharmaceutical company incorporated in the field of 'Transfusion Medicine, which includes operation of blood centers and plasma fractionation.

The company's goal is to achieve self sufficiency in blood/plasma products in India and SAARC nations and grow globally.

The following few paragraphs are a brief introduction of its parent company Trigenesis Life sciences, its history and its business activities. In the history of Indian Pharmaceutical Lifesciences industry, one name is worth a reckon i.e. Trigenesis Lifesciences (Pvt.) Ltd. It is the dominant and vital arm of RSM group having diversified business areas such as Textile clothing, Finance consulting and plastic additives & mouldings along with Pharmaceuticals.

In the realm of success, today RSM group earns a standing as one of the top 20 well trounced conglomerate business group of the Indian Inc. with group turnover exceeding Rs 1600 million. RSM pharmaceuticals, the Flag Ship Company of the group struck its roots in the Indian pharmaceutical distribution and marketing industry in 1987 and presently is one of the top 5 distribution houses, employing around 500 people having an annual turnover of Rs. 500 Million. RSM group is built on the sturdy pillars of reliability, sound infrastructure, operational expertise and financial stability.

The success of RSM group in the distribution sector has given a strong footage for Trigenesis Lifesciences (P) Ltd - A business venture destined to the noble cause of social welfare in the emergency and critical care segment.

The Therapeutic Marvels include:

- Biologicals; Plasma Products
- Hormonal Therapy
- Recombinant Therapeutics
- Sterile anti Infectives
- Oncology

- Antibiotics lyophilized
- Anesthetics
- Endocrinal Steroids
- Cardiovascular drugs
- Nutritional Supplements

Chapter-2 ABOUT THE PROJECT

2.1 Problem Statement

For an aspiring company to do business in protein therapy the plasma market is not very congenial since plasma products such as IVIG, Human Albumin, Anti-D, Hepatitis and Tetanus Immunoglobulin all are very expensive, their only source being Human Blood & blood donors have to be paid hefty sums of money for any donation of blood they make. Another issue, which troubles, is the lack of awareness since plasma products are new to the market and there is little awareness among doctors & patients alike regarding its usage & implementation. Some of the other concerns will include:

1. Ever rising cost of plasma.
2. Government control of pricing. Since the government does not want the prices of plasma products to jet off beyond the reach of the common man.
3. Poor worldwide harmonization of regulatory issues.
4. Import Limitations.

Therefore the project has been undertaken to understand the facts related with the Plasma Products Therapy and Blood Banking System. The study was done to identify and analyze various factors (availability, pricing, better product, awareness etc) which constrain any consumer towards prescription of any Plasma Product.

With an in depth market survey on the plasma market the project seeks to determine the demand, the consumption pattern, personal preferences of doctors for Plasma Products in Northern Region of India (Delhi and Noida).

2.2 Research Objectives-

The Key Research Objectives are:

- ✓ To identify factors that determine the prescribing behaviour of doctors.
- ✓ To study the consumption pattern of existing consumers.

Chapter-3 RESEARCH METHODOLOGY

3.1 Research Design (Descriptive Research)

Research design is a total plan or strategy of a proposed research. Descriptive research method was used.

3.2 Sampling Frame

Delhi was divided into 4 zones for this survey.

The 4 Zones included-

- Central Delhi
- North Delhi,
- South Delhi,
- Noida.

3.3 Data Collection

Structured Questionnaire was designed considering the various factors identified, so that the data collected would be in compliance with the information needed. (Copy Enclosed)

In-depth interviews were conducted which were optimal for collecting data on individuals personal perspectives, and experiences.

3.4 Sample Design

3.4.1 Target population:

The doctors prescribing Plasma Products were the respondents of the Questionnaire the doctors selected were of reputed hospitals. (Copy Enclosed)

3.4.2 Sample Size:

The sample size was 180.

3.4.3 Sampling Technique:

Judgmental sampling method was used.

3.5 Field Work

The survey was conducted keeping in view the consumers of Plasma products. The survey was conducted in Delhi and Noida region.

CHAPTER 4 .ANALYSIS AND INTERPRETATION OF DATA

Data obtained from the questionnaires was summarized in MS-Excel 2007 and was analyzed using tools of excel.

The Analysis of the data has been done separately for each product from Question 1 to Question 5; thereafter a common analysis for all the products is presented from Question 6 to Question 12.

4.1 IVIG

4.1.1 Usage of IVIG.

Out of 143 respondents 70% of the respondents have been using IVIG for more than 7 years,20% for 3-7 years and 10% for <3 year.

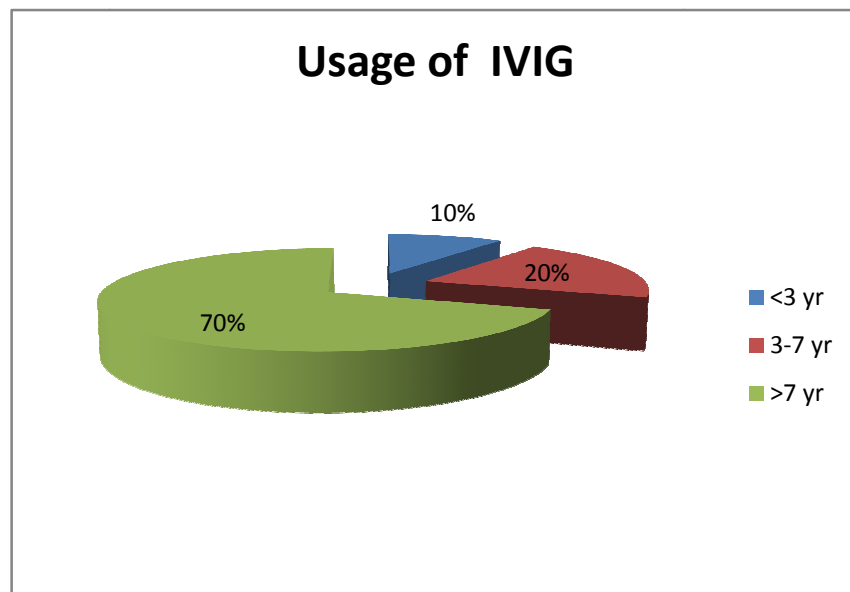


Fig 1.Source: Questionnaire data analysis Q. no 1

4.1.2 Availability of IVIG.

The availability of IVIG has been excellent for 34% or 48 respondents, good for 65% or 92 respondents and poor for 1% or 2 respondents.

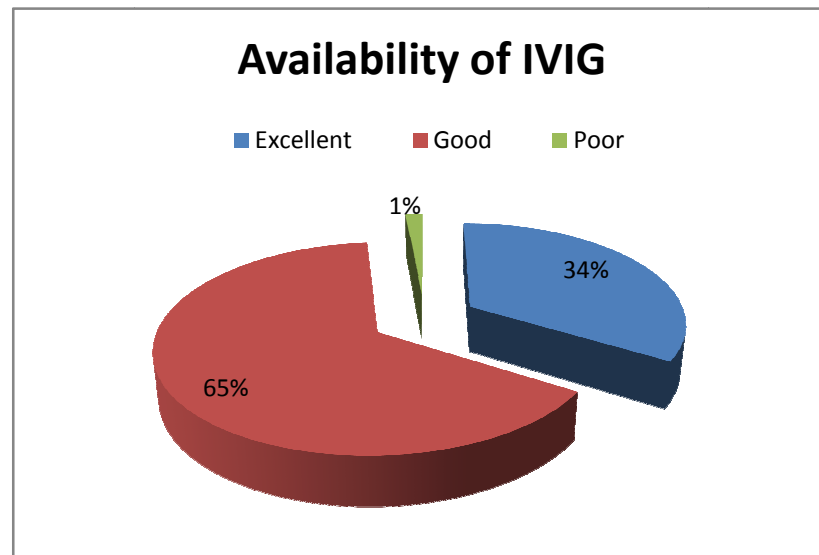


Fig 2. Source: Questionnaire data analysis Q. no 2.

4.1.3 Specific Brand Preference

Most of the doctors i.e. 91% don't prefer any specific brand while prescribing any Plasma Product, 4% doctors prefer Bharat Serum (Gamma IV) followed by 3% for other brands (VHB, Baxter, Gamma Glob) and 2% for Reliance (Immunorel).

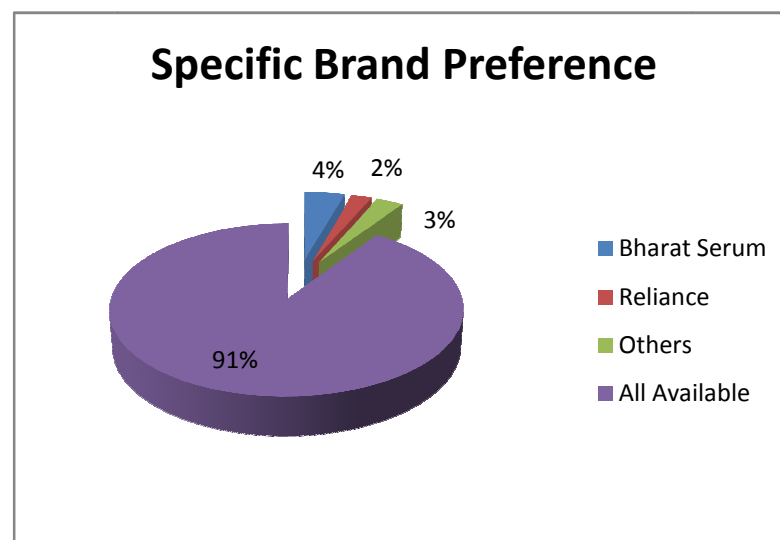


Fig 3. Source: Questionnaire data analysis Q. no 4.

4.1.4 Reason For Brand Preference.

The reason for preferring any IVIG brand is availability in 53% of the cases, followed by better product (30%) and pricing in 16% of the respondents.

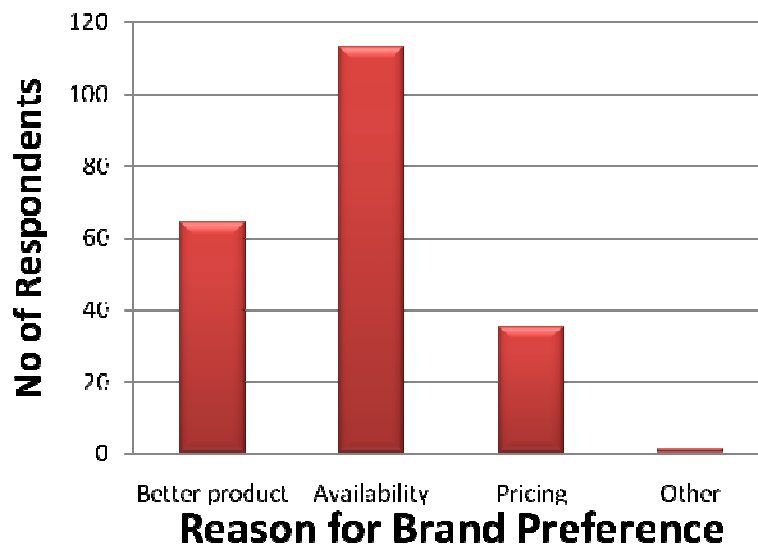


Fig 4. Source: Questionnaire data analysis Q. no 4.

4.1.5 Consumption Pattern Per Month.

Out of total 144 respondents, 104 respondents prescribe <10 IVIG per month on an average, followed by 31 respondents who prescribe 10 to 20 IVIG and only 9 respondents prescribe >20 IVIG per month.

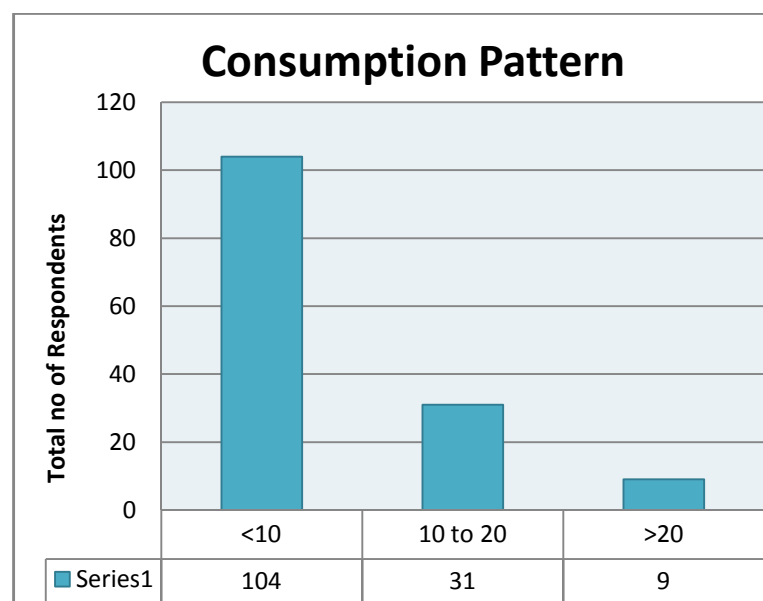


Fig 5. Source: Questionnaire data analysis Q. no 5

4.2 Hepatitis B Immunoglobulin

4.2.1 Usage of Hepatitis B Immunoglobulin

Out of 103 respondents 71% of the respondents have been using Hepatitis B Immunoglobulin for more than 7 years, 18% for 3-7 years and 11% for <3 years.

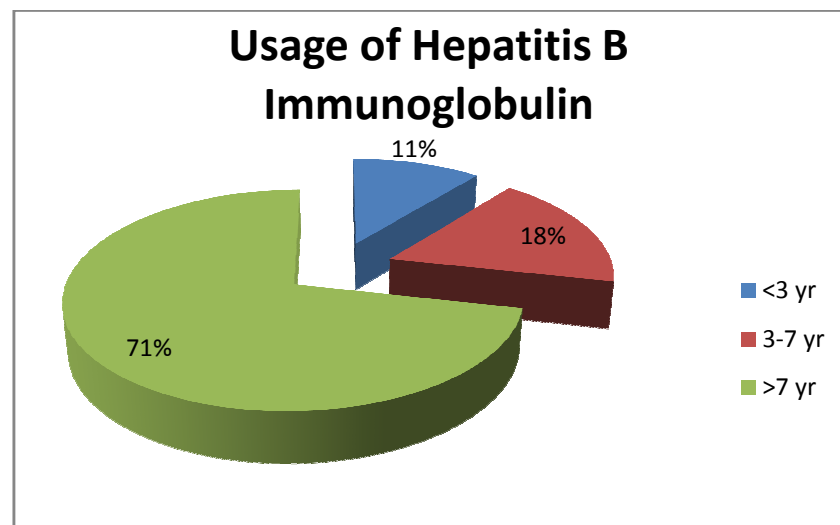


Fig 6 Source: Questionnaire data analysis Q. no 1

4.2.2 Availability of Hepatitis B Immunoglobulin.

The availability of Hepatitis B Immunoglobulin has been excellent for 28% or 29 respondents, good for 71% or 73 respondents and poor for 1% or 1 respondent.

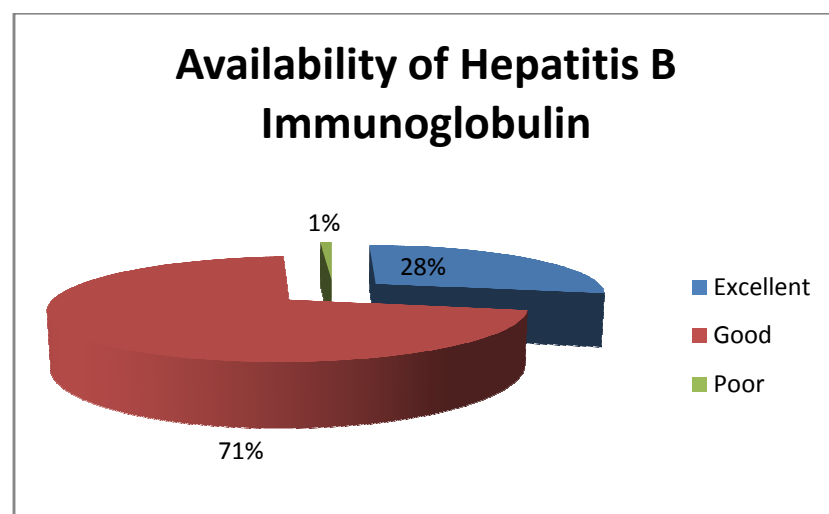


Fig 7 Source: Questionnaire data analysis Q. no 2.

4.2.3 Specific Brand Preference.

Most of the doctors i.e. 95% don't prefer any specific brand (use all brands available) while prescribing any Plasma Product, 3% doctors prefer Reliance followed by 2% for Bharat Serum.

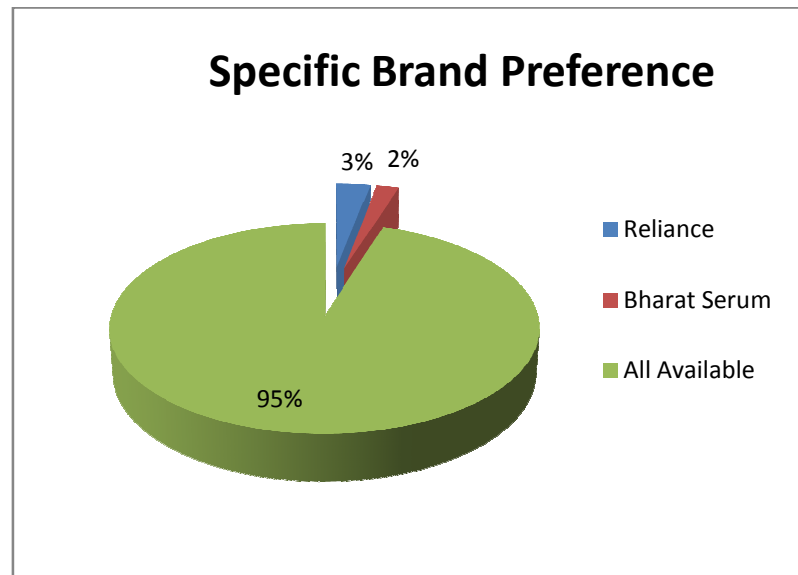


Fig 8.Source: Questionnaire data analysis Q. no 3.

4.2.4 Reason For Brand Preference.

The reason for preferring any Hepatitis B Immunoglobulin brand is availability in 56% of the cases, followed by better product (29%) and pricing in 15% of the respondents.

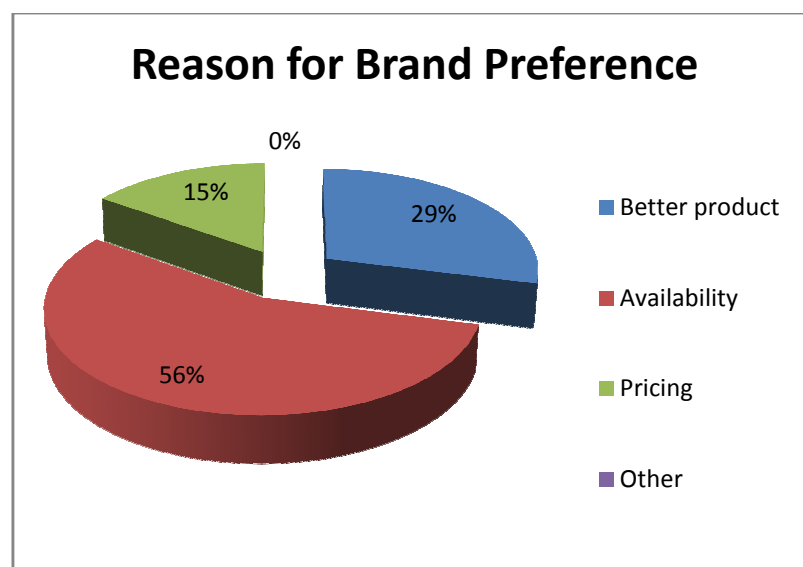


Fig 9 .Source: Questionnaire data analysis Q. no 4

4.2.5 Consumption Pattern Per Month.

Out of total 105 respondents, 88 respondents prescribe <10 Hepatitis B Immunoglobulin per month on an average, followed by 15 respondents who prescribe 10 to 20 Hepatitis B Immunoglobulin and only 1 respondent prescribe >20 Hepatitis B Immunoglobulin per month.

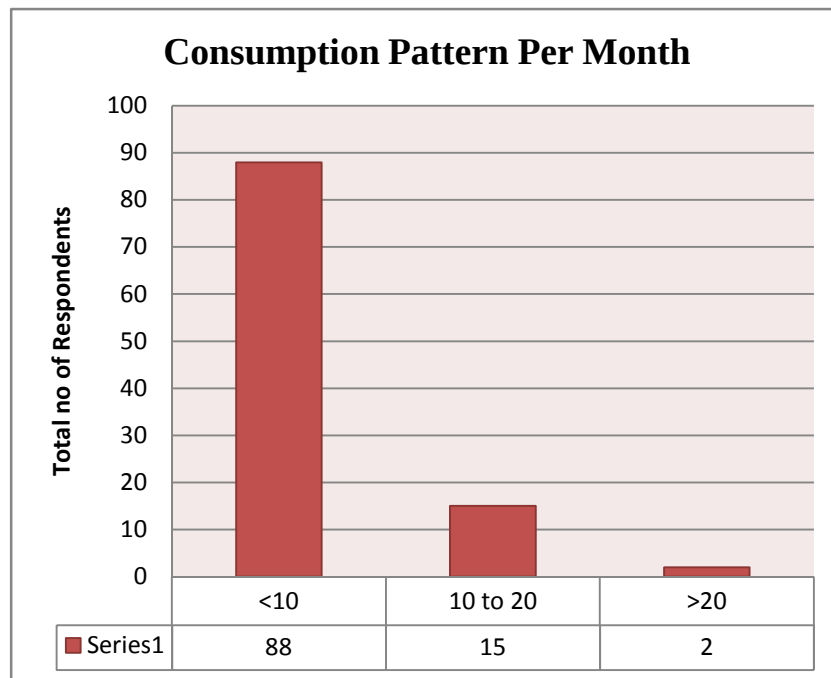
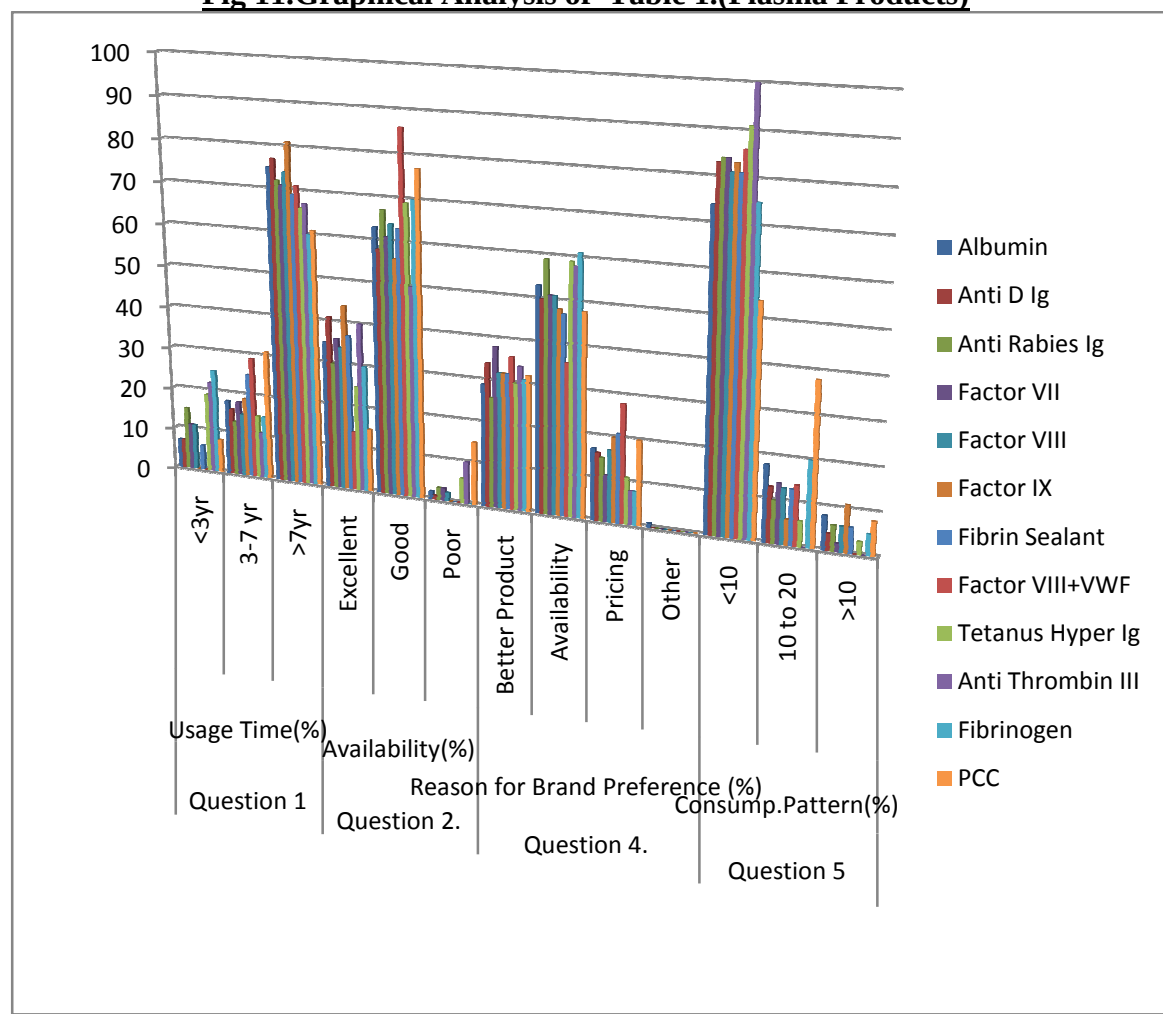


Fig 10. Source: Questionnaire data analysis Q. no 5.

4.3 Table 1 The percentage wise analysis of Plasma Products is as under

	Question 1			Question 2.			Question 3	Question 4.				Question 5		
	Usage Time(%)			Availability(%)			Brand Pref.	Reason for Brand Preference (%)				Consump.Pattern(%)		
	<3yr	3-7 yr	>7yr	Excellent	Good	Poor		Better Product	Availability	Pricing	Other	<10	10 to 20	>10
Albumin	7	18	75	35	63	2	Alburex	29	53	17	1	74	18	8
Anti D Ig	7	16	77	41	58	1	Rhogam	34	50	16	0	83	13	4
Anti Rabies Ig	15	13	72	30	67	3	-	26	59	15	0	84	10	6
Factor VII	11	18	71	36	61	3	Baxter	38	51	11	0	84	14	2
Factor VIII	11	15	74	34	64	2	Baxter	32	51	17	0	81	13	6
Factor IX	0	19	81	44	56	0	Baxter	32	48	20	0	83	6	11
Fibrin Sealant	6	25	69	37	63	0	Tissel	32	47	21	0	81	13	6
Factor VIII+V	0	29	71	14	86	0	-	36	36	28	0	86	14	0
Tetanus Hyp	19	15	66	25	69	6	-	30	59	11	0	91	6	3
Anti Thromb	22	11	67	40	50	10	-	34	58	8	0	100	0	0
Fibrinogen	25	15	60	30	70	0	-	31	61	8	0	75	20	5
PCC	8	31	61	15	77	15		32	48	20	0	54	38	8

Fig 11. Graphical Analysis of Table 1.(Plasma Products)



4.4 Common Analysis of Questionnaire for all Plasma Products from Question 6 to Question 12

4.4.1 Importance of Source of Plasma

58% of the respondents consider source of plasma as a very critical factor in the selection of Plasma Product, 34% of the respondents consider it critical while 8% consider it not a critical factor in selecting any Plasma Product.

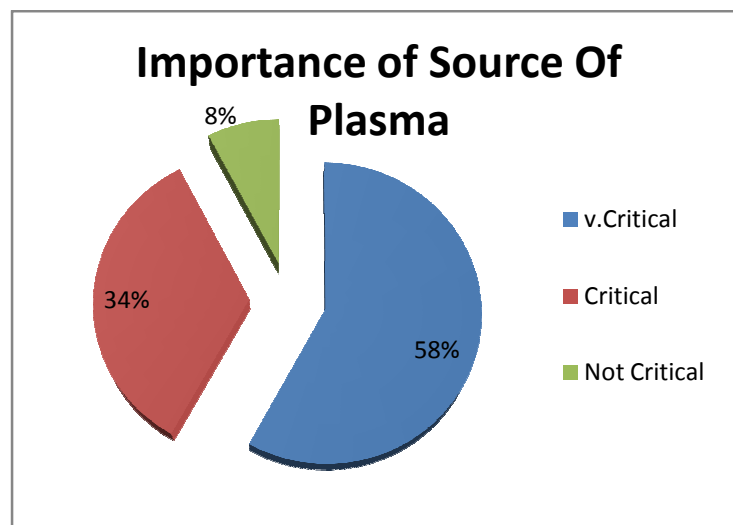


Fig12.Source: Questionnaire data analysis Q. no 6.

4.4.2 Safety Issues for the products.

65% of the respondents believe that *Viral Infections/Reactions/Side effects* caused by Plasma products are the major safety concern, while 20% believe the *Source/Quality* of Plasma Product is a safety issue.

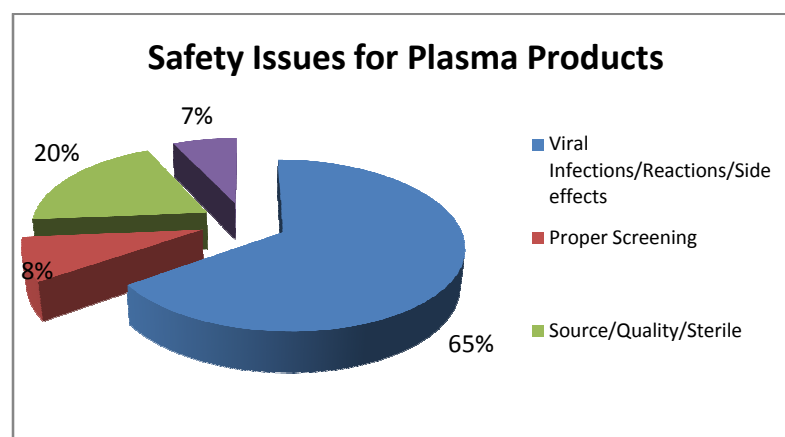


Fig13. Source: Questionnaire data analysis Q. no 7

4.4.3 Satisfaction on the Quality of Currently Available Brands.

120 respondents were satisfied with the quality of currently available brands, 21 were highly satisfied, 2 were not satisfied and 1 respondent thinks that the product needs improvement.

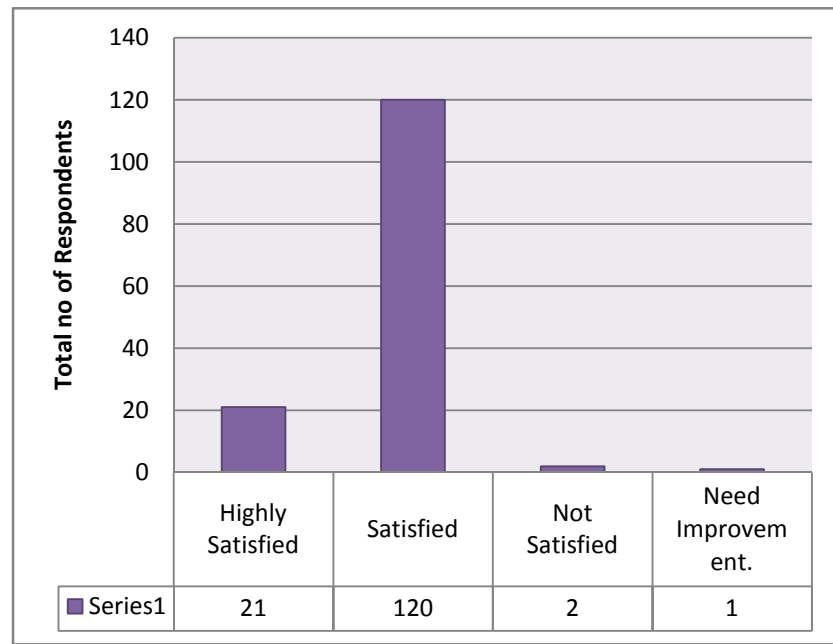


Fig 14.Source: Questionnaire data analysis Q. no 8.

4.4.4 Pricing of the Currently Available Brands.

Majority i.e. 82% of the respondents opine that IVIG is expensive, 17% of the respondent think its affordable and 1% think it's not affordable .

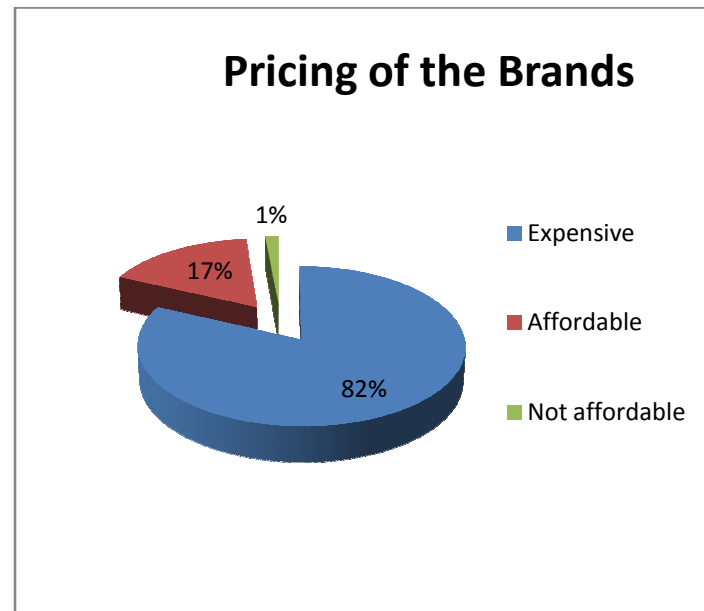


Fig 15. Source: Questionnaire data analysis Q. no 9.

4.4.5 Need for Awareness Program

Out of total 143 respondents 120 respondents feel there is a need of awareness program for patients' doctors and paramedical staff, 23 respondents doesn't feel it's required.

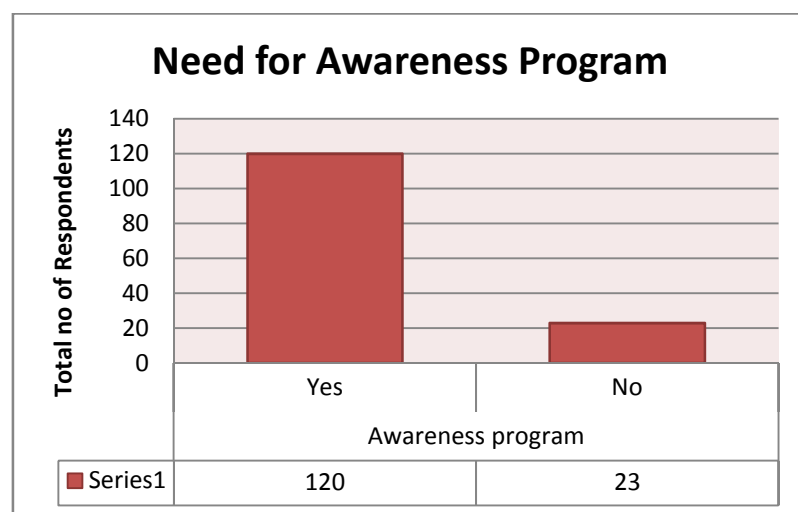


Fig 16. Source: Questionnaire data analysis Q. no 10

4.4.6 Basis of Trust on Plasma Product.

Majority of respondents i.e. 59% or 123 consider company's image or its safety record while trusting any brand of Plasma Product while 32% or 68 consider the product important while trusting its brand.

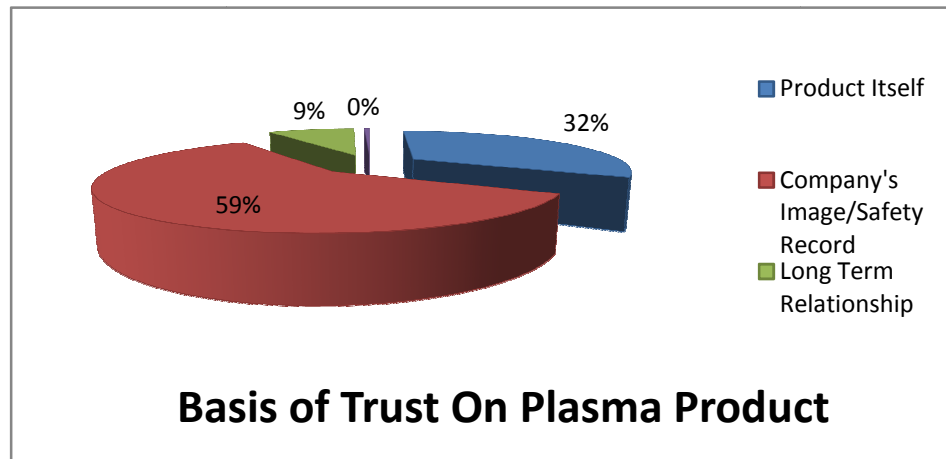


Fig 17.Source: Questionnaire data analysis Q. no 11.

4.4.7.Issues while Prescribing Plasma Products.

The major issue faced by 55% doctors in prescribing Plasma Products is Cost, followed by Safety/Quality/Source of Plasma and 10% doctors facing Allergic Reactions.

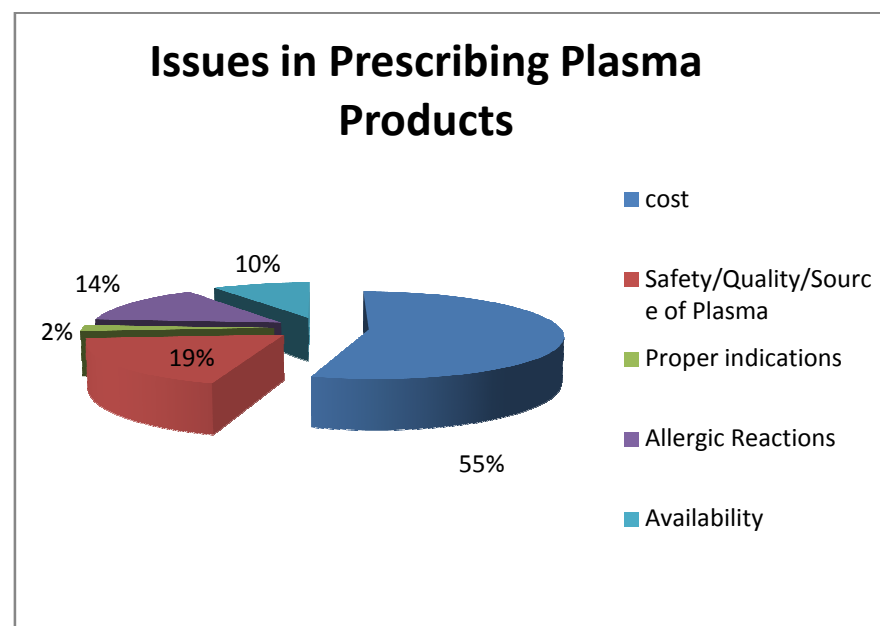


Fig 18.Source: Questionnaire data analysis Q. no 12.

4.5 FINDINGS AND CONCLUSIONS

4.5.1 IVIG

1. Among 143 respondents 70% of the respondents have been using IVIG for more than 7 years, 20% for 3-7 years and 10% for <3 year. Thus the opinion of senior doctors plays a major role in the prescription of Plasma Products (here IVIG).
2. The availability of IVIG has been excellent for 34% or 48 respondents, good for 65% or 92 respondents and poor for 1% or 2 respondents. Thus it can be figured out that the availability is not excellent for IVIG.
3. Most of the doctors i.e. 91% don't prefer any specific brand while prescribing any Plasma Product, 4% doctors prefer Bharat Serum (Gamma IV) followed by 3% for other brands (VHB, Baxter, Gamma Glob) and 2% for Reliance (Immunorel). This can be concluded from this statement that brand name is not a concern for majority of doctors.
4. The reason for preferring any IVIG brand is availability in 53% of the cases, followed by better product (30%) and pricing in 16% of the respondents. Thus if the product is available easily and readily, doctors will be using it also considering the pricing.
5. Among 144 respondents, 104 respondents prescribe <10 IVIG vials per month on an average, followed by 31 respondents who prescribe 10 to 20 vials of IVIG and only 9 respondents prescribe >20 vials of IVIG per month.
6. 58% of the respondents consider source of plasma as a very critical factor in the selection of Plasma Product, 34% of the respondents consider it critical while 8% consider source of Plasma not a critical factor in selecting any Plasma Product.
7. 65% of the respondents believe that *Viral Infections/Reactions/Side effects* caused by Plasma products are the major safety concerns, while 20% believe that the *Source/Quality* of Plasma Product is a safety issue.

8. 120 respondents were satisfied with the quality of currently available brands, 21 were highly satisfied, 2 were not satisfied and 1 respondent thinks that the product needs improvement.
9. Majority i.e. 82% of the respondents opine that IVIG is expensive, 17% of the respondent think its affordable and 1% think it's not affordable .Thus the pricing of the plasma products should be competitive.
10. Amongst 143 respondents 120 respondents marked that there is a need of awareness program for patients' doctors and paramedical staff, 23 respondents don't feel it is required.
11. Majority of respondent's i.e. 59% or 123 consider company's image or its safety record while trusting any brand of Plasma Product while 32% or 68 consider the product important while trusting its brand.
12. The major issue faced by 55% doctors in prescribing Plasma Products is Cost, followed by Safety/Quality/Source of Plasma with 10% doctors facing allergic reactions.

4.5.2 Hepatitis B Immunoglobulin

1. Among 103 respondents 71% of the respondents have been using Hepatitis B Immunoglobulin for more than 7 years, 18% for 3-7 years and 11% for <3 year.
2. The availability of Hepatitis B Immunoglobulin has been excellent for 28% or 29 respondents, good for 71% or 73 respondents and poor for 1% or 1 respondent.
3. Most of the doctors i.e. 95% don't prefer any specific brand (use all brands available) while prescribing any Plasma Product, 3% doctors prefer Reliance followed by 2% for Bharat Serum.
4. The reason for preferring any Hepatitis B Immunoglobulin brand is availability in 56% of the cases, followed by better product (29%) and pricing in 15% of the respondents.

5. 105 respondents, 88 respondents prescribe <10 vials of Hepatitis B Immunoglobulin per month on an average, followed by 15 respondents who prescribe 10 to 20 vials of Hepatitis B Immunoglobulin and only 1 respondent prescribe >20 vials of Hepatitis B Immunoglobulin per month.
6. 58% of the respondents consider source of plasma as a very critical factor in the selection of Plasma Product, 34% of the respondents consider it critical while 8% consider it not a critical factor in selecting any Plasma Product.
7. 65% of the respondents believe that *Viral Infections/Reactions/Side effects* caused by Plasma products are the major safety concern, while 20% believe the *Source/Quality* of Plasma Product is a safety issue.
8. 120 respondents were satisfied with the quality of currently available brands, 21 were highly satisfied, 2 were not satisfied and 1 respondent thinks that the product needs improvement.
9. Majority i.e. 82% of the respondents opine that IVIG is expensive, 17% of the respondent think its affordable and 1% think it's not affordable.
10. Among 143 respondents 120 respondents feel there is a need of awareness program for patients doctors and paramedical staff, 23 respondents don't feel its required.
11. Majority of respondents i.e. 59% or 123 consider company's image or its safety record while trusting any brand of Plasma Product while 32% or 68 consider the product important while trusting its brand.
12. The major issue faced by 55% doctors in prescribing Plasma Products is Cost, followed by Safety/Quality/Source of Plasma and 10% doctors facing Allergic Reactions.

CHAPTER 5. RECOMMENDATIONS

1. As Availability of few Plasma Products is not excellent, and majority of plasma products are used mainly on the basis of availability, the company should try to make this product readily available in the market.
2. The companies can follow competitive pricing, as it has been found by the analysis, that these products are expensive but the major concern for doctors is quality and availability.
3. The doctors want Plasma products of high quality. Therefore the company can highlight on the quality of their products, purification method and safety record part to increase their sales.
4. The doctors are not very well aware about the usage of these products, therefore the company should also focus on increasing the awareness about the usage of these products by incorporating awareness programs on these plasma products.
5. Many doctors were not aware of any brand of Plasma Product by PlasmaGen Biosciences, so the company should try to increase their products awareness by increasing their sales team and by making frequent visits to the doctors.
6. The demand in emerging countries, such as China and India is persistently on the rise. The entries of new recombinant products, which compete with existing blood plasma products, have started a price competition creating a downward pressure on prices. Therefore the companies should follow competitive pricing.
7. The usage of plasma components should be promoted, as many of the blood banks were found to be whole blood blood bank .In whole blood, platelets die and clotting factors become ineffective and the patient receives unwanted and ineffective components.

CHAPTER 6 ANNEXURE

6.1 Questionnaire for Plasma Products

PlasmaGen Biosciences Pvt. Ltd.

No.160, KCI Chambers, 2nd Floor, 5th Main Road,
Chamarajapet, Bangalore-560018.

Ph: + 91-80-42154535/36/37 Fax: + 91-80 - 421 545 38 Email : info@plasmagen.in

Name:.....

Address.....

.....

.....City

Ph.No. / Mobile :

Email:.....

.....

1. How long you have been using _____ ?

a. Less than 3 yr, b. 3-7 yr, c. More than 7 yr.

2. Availability of product has been...

a. Excellent, b. Good, c. Poor.

3. Any specific _____ brand you prefer

4. Is it because of

a. Better Product b. Availability c. Pricing
d. Other ()

5. What is general consumption pattern?

a. Less than 10, b. 10- 20, c. More than 20.

- 1) IVIG - 0.5gm, 1gm, 2.5gm, 5gm
- 2) Hepatitis's B Immunoglobulin 100 IU/200IU
- 3) Albumin -20%100ml,5%100ml.LS-20%100 ml
- 4) Anti D immunoglobulin
- 5) Anti Rabies Immunoglobulin
- 6) Factor VII
- 7) Factor VIII
- 8) Factor IX
- 9) Fibrin sealant
- 10) Factor VIII +VWF
- 11) Tetanus Hyper Immunoglobulin
- 12) Anti Thrombin III
- 13) Fibrinogen
- 14) Prothrombin complex concentrate

6. Because it is a biologic "made out of human plasma"; would you consider source of plasma important criterion in selection of the product? _____

- a. Very critical, b. Critical, c. Not critical.

7. Any safety issues for these products?

8. Your opinion on the quality of currently available _____ brands?

- a. Highly satisfied b. Satisfied c. Not satisfied d. Need improvement

9. Pricing of currently available _____ brands?

- a. Expensive, b. Affordable, c. Not Affordable.

10. Does any awareness program about blood/ plasma products is required for patients / doctors / paramedical staff?

- a. Yes b. No.

11. How do you trust a brand of blood plasma product ?

- a. Product itself b. Company's image / safety record
c. Long term relationship d. Any other factor ()

12. What are the major issues in prescribing plasma products to the patients.

13 Any references, if you would like to give

6.2 List of Hospitals Visited

S no.	Hospitals Visited
1	Aiims, Ansari Road
2	Indian Spinal Injury Centre, Vasant Kunj
3	Safdarjung Hospital, Ansari Road
4	Max, Patparganj
5	Guru Teg Bahadur Hospital, Shahdara
6	Sir Ganga Ram Hospital
7	Jain hospital, Jagriti Enclave
8	Ram Manohar Lohia Hospital
9	Sir Ganga Ram Hospital
10	Jaipur Golden, Rohini
11	MAX, Saket
12	IHBAS, Shahdara
13	Metro Hospital, Noida
14	Kailash Hospital and Heart Institute, Noida
15	Fortis, Noida
16	St. Stephens Hospital, Tis Hazari
17	Action Cancer Hospital
18	Holy Family Hospital, Okhla
19	Indraprastha Apollo Hospital
20	Baba Saheb Ambedkar Hospital, Rohini
21	Swastik clinic, Rohini
22	Rajiv Gandhi Cancer Hospital, Rohini
23	Rohini Polyclinic and Diagnostic Centre
24	Prashant Nursing Home
25	Arihant Jain Clinic, Rohini
26	Narayan Clinic, Rohini
27	Pasricha Medical Heart Chest and Diabetes Clinic
28	Dev Clinic, Bhagwan Mahavir Hospital
29	Vijay clinic, Vishaka Enclave, Pitampura
30	Saroj Hospital
31	Amar Jyoti Maternity Clinic, Mangolpuri
32	Brahm Shakti Hospital
33	Maharaj Agrasen, Punjabi Bagh
34	B L Kapoor Hospital, Rajender Nagar
35	

Part II

(Report on Blood Banks)

EXECUTIVE SUMMARY

India's blood banking system has serious shortcomings. The gap between demand and supply of blood is continuously widening. India has an annual requirement of approximately, 5.0 million units of blood. The actual collection is only approximately 3.50 million units. A study conducted by the National AIDS Control Organization(NACO), regarding blood banking services in India has revealed many shortcomings, including the decentralized nature of blood services, a shortage of human, technological and financial resources and a deficit in the availability of blood, especially from voluntary donors. Paradoxically, very few blood banks are operating to their full capacity. Inappropriate use of blood and wastage is not an uncommon occurrence. Even during an emergency, the onus is on the patient's relatives to arrange for replacement of blood. The Project has been undertaken to understand the working of blood banks in the northern region of India i.e. Delhi and Noida and to check for the availability of surplus plasma with these blood banks.

The findings of the report suggest that most of the blood banks are found to be Hospital associated blood banks followed by Government Blood Banks. Despite such technological advancement in the field of Medicine, few of the blood banks were found to be operating Whole Blood Blood Banks, others were doing componentization of >90% of the blood available with them. The components prepared was being issued (>50%) to the patients. Most of the blood collected by the blood banks was through Voluntary blood donation. In Most of the Blood Banks screening was done using ELISA IV.

A significant number of responses reveal that there is surplus amount of plasma available with these blood banks that could be utilized for fractionation.

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Chapter 1.About the Project

1.1 Problem Statement

The project has been undertaken to understand the present scene of Blood Banks and ,the challenges in making India self sufficient in the field of blood plasma.

The study was done to identify and the fill the gap between demand and supply of Plasma and to find the availability of surplus plasma in the given region of study.

1.2 Research Objectives-

The Key Research Objectives are:

- ✓ To study the availability of surplus plasma and its usage at various Blood Banks.
- ✓ To identify the challenges in making India self sufficient in the field of Blood Plasma.

Chapter 2. Research Methodology

2.1 Research Design

Descriptive Research design was used.

2.2 Sampling Frame

The Blood Banks were categorised as under:

- Blood Banks under Central Govt.
- Blood Banks under Govt of Delhi.
- Blood Banks under MCD.
- Blood Banks under Private Hospitals.
- Blood Banks under Voluntary Organisation.

2.3 Data Collection

Structured questionnaire was designed. (Copy Enclosed)

Face to Face interviews were conducted with the technical staff of the Blood Banks.

2.4 Sample Design

2.4.1 Target population:

The Blood Banks that were well known and accessible were selected for the study.
All the Blood Banks in NCR region were covered for the study.

2.4.2 Sample Size:

The sample size was 40.

2.4.3 Sampling Technique:

Judgemental Sampling method was used.

2.5 Field Work:

The survey was conducted in all the Blood Banks of the given region. The survey was conducted in Delhi.

Chapter 3. Analysis and Interpretation of Data

Data obtained from the questionnaires was summarized in MS-Excel 2007 and was analyzed using excel analytical tools.

The Analysis of the data has been done separately for each Question.

1.Nature of Blood Bank

The maximum number of Blood Banks were Hospital Associated (55%), followed by govt and Pvt. Blood Banks, (17%), and Charitable Blood Banks (11%)

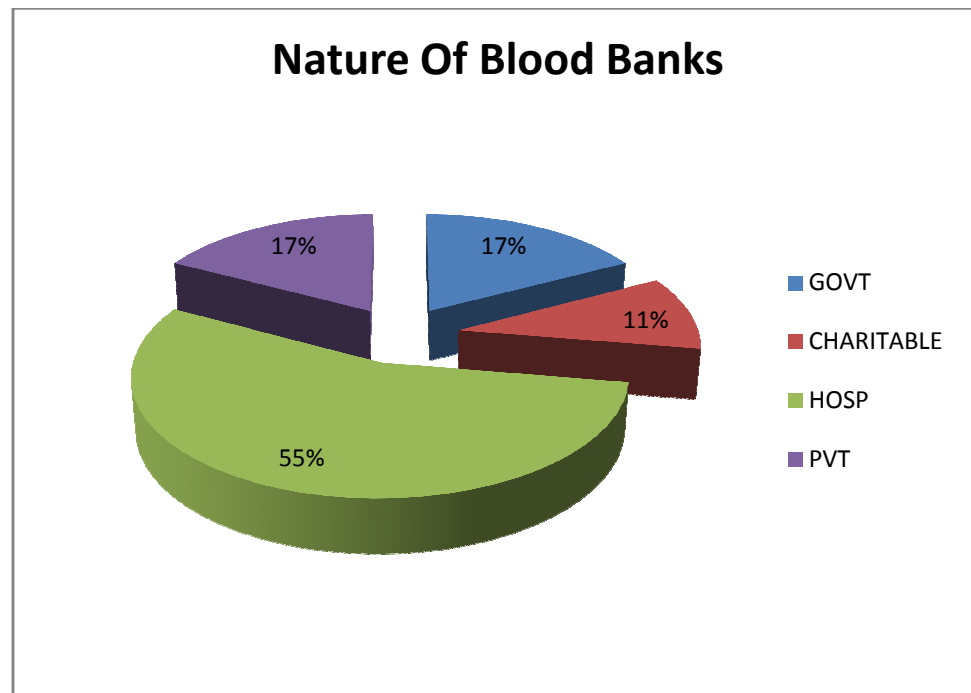


Fig 1.Source: Questionnaire data analysis Q. no 1.

2. License No and Validity provided by:

17 Blood banks shared their License number and details, 12 Blood Banks refused to share this detail.

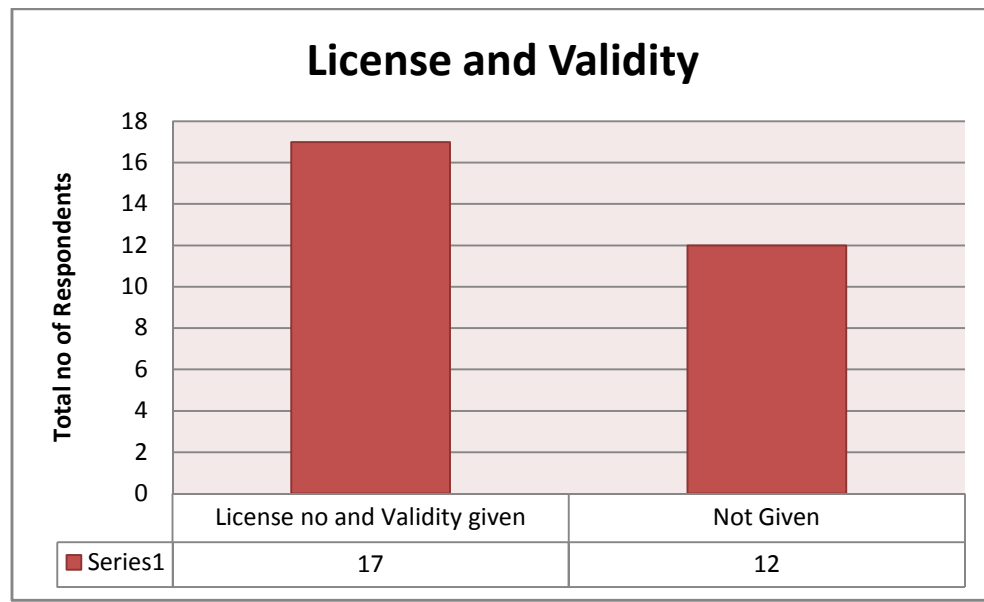


Fig 2.Source: Questionnaire data analysis Q. no 2.

3.Permission to conduct Blood Collection Drives/Camps.

9 Blood Banks had permission to conduct Blood Collection Drives/Camps,20 Blood Banks did not have permission to do so.

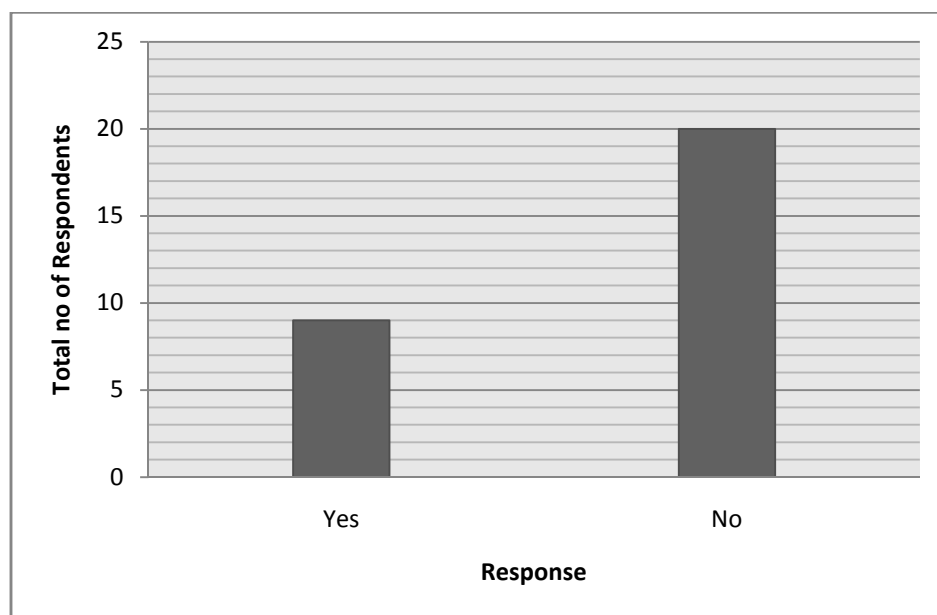


Fig 3.Source: Questionnaire data analysis Q. no.3.

4.License To Prepare Plasma Products:

48% Blood Banks have License to prepare all products mentioned, 28% prepare all products except cryoprecipitate, 17% deal with only whole blood and 7% prepare Packed RBCs.

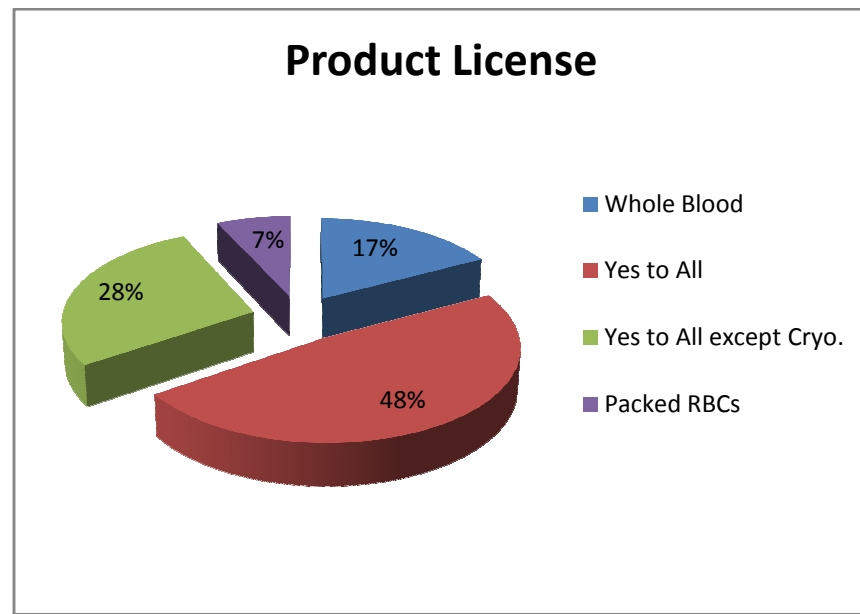


Fig 4.Source: Questionnaire data analysis Q. no 4.

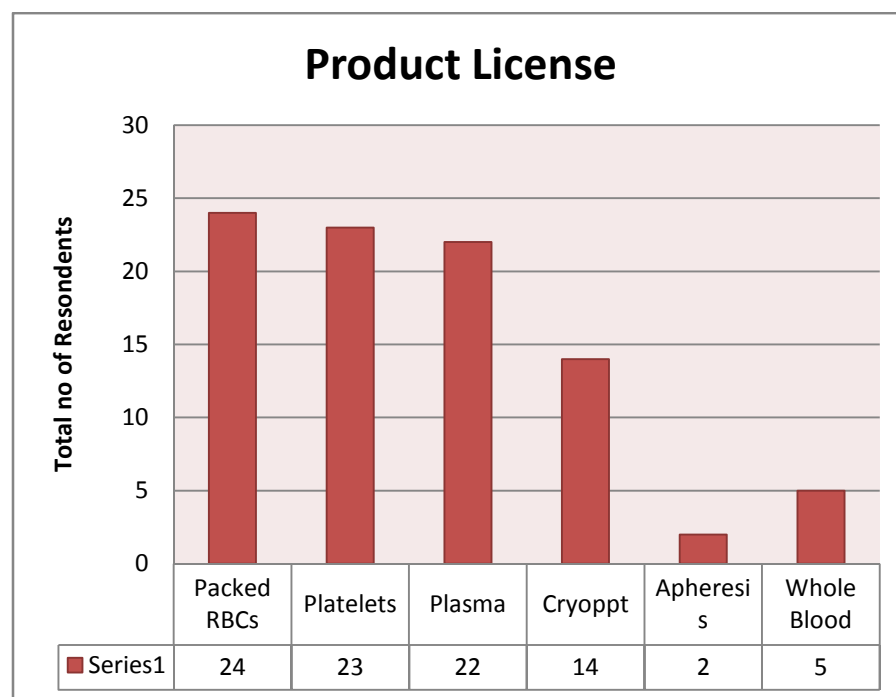


Fig 5.Source: Questionnaire data analysis Q. no 4

5.Total Blood Collection (2011-2012):

73% of the blood banks had collected <10000 units in the yr 2011-2012_ ,followed by <15000 and <30000 units for 10% of the Blood Banks.

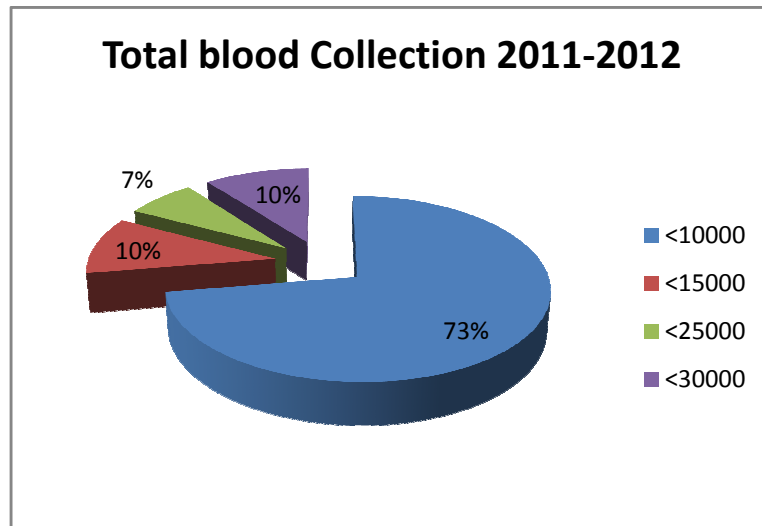


Fig 6. Source: Questionnaire data analysis Q. no 5

6. Blood Bags Usage:

31% of the Blood Banks are using Single Blood Bag,29% are using Triple Blood Bag,21% Double Blood Bag and 19% are using Quadruple Blood Bag.

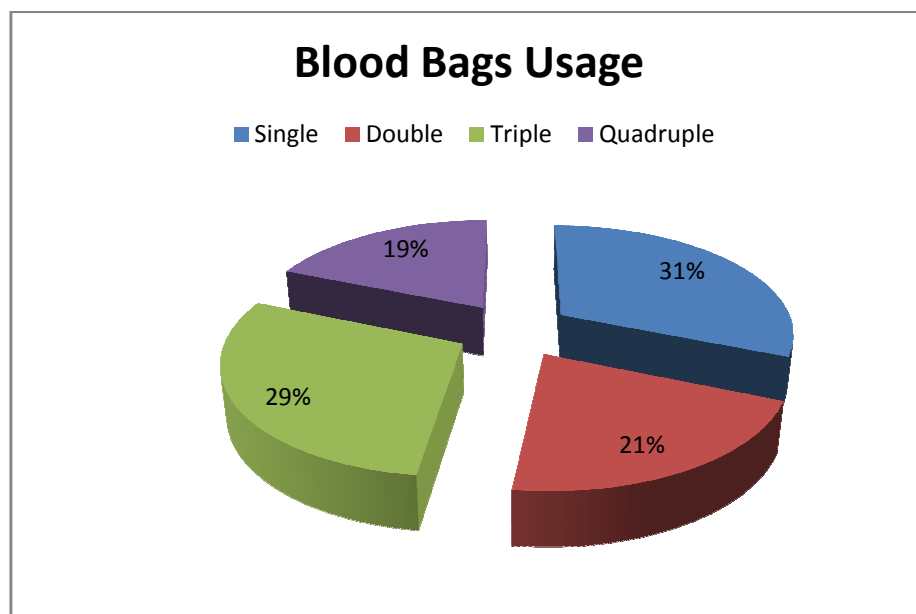


Fig 7. Source: Questionnaire data analysis Q. no 6

7.Blood Bag Preference,company wise:

Terumo Pempol is the product of choice for 41% of the Blood Banks, followed by Fenwal and Mitra Industries ,preferred by 24% of the Blood Banks,HLL is least preferred with 11% of the total Blood Banks using it.

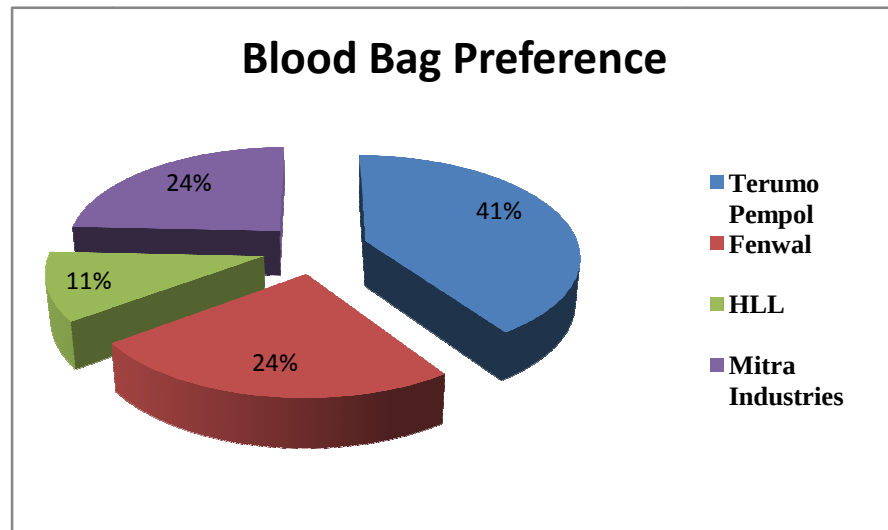


Fig 8. Source: Questionnaire data analysis Q. no 7

8.Percentage of Voluntary Blood Collection:

41% of the Blood Banks have >10% of Voluntary Blood Collection, 21% of the Blood Banks have >50% of Voluntary Blood Collection, 17% of the Blood Banks have >70% and >30% of the Total Voluntary Blood collection.

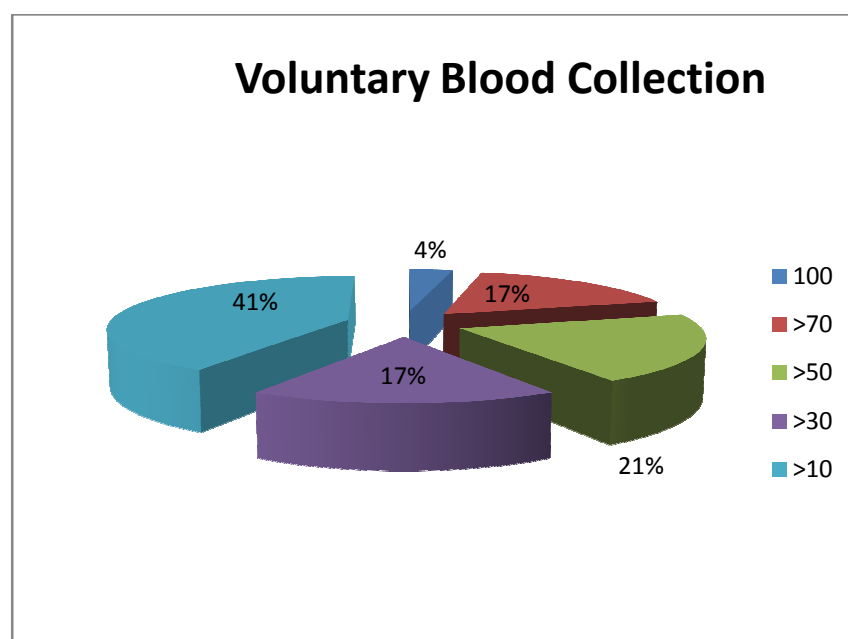


Fig 9.Source: Questionnaire data analysis Q. no 8

9. Percentage of Blood Componentisation.

26% of the Blood Banks do 100 % or >90% of the componentization of the total blood collected. 18% of the Blood Banks componentise >70 % of the blood collected, 17% of the Blood Banks Componentise >40% of the collected blood and 13% of the Blood Banks do 80% componentization of the total blood Collected.

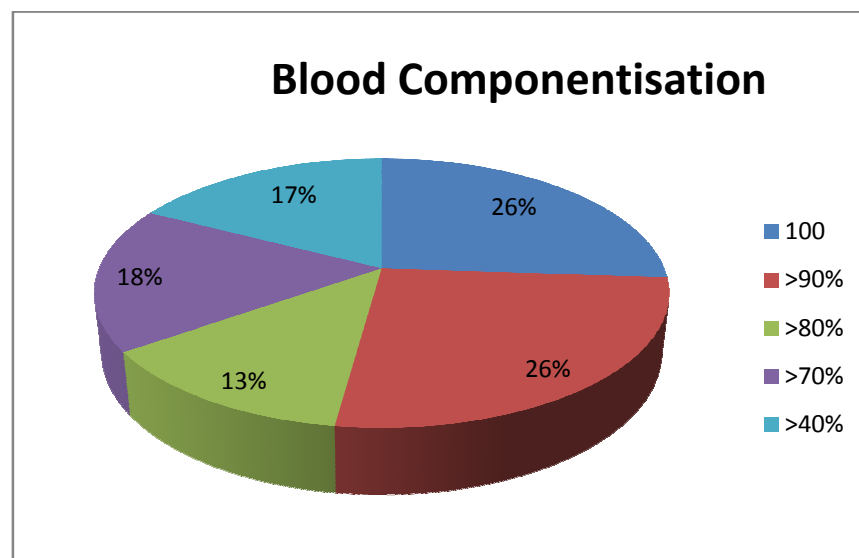


Fig 10. Source: Questionnaire data analysis Q. no 9

10. Percentage of Issuance of Plasma Components to Patients.

7 Blood Banks issue >50% of the plasma components which they prepare, 5 Blood Banks each issue >40% and >90% of the total components prepared.

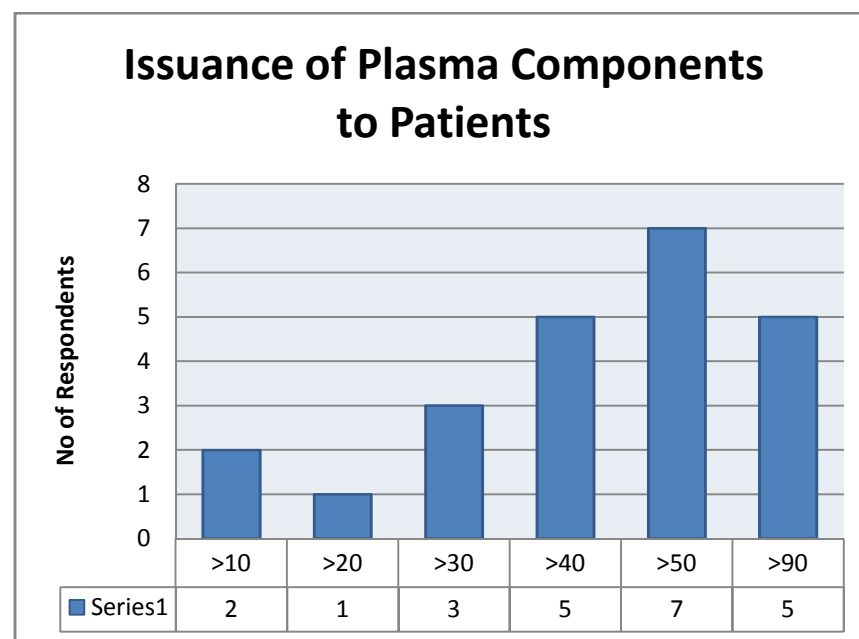


Fig 11. Source: Questionnaire data analysis Q. no 10

11.Blood/Plasma Screening

Maximum Screening is done by ELISA IV method for HIV,HBV and HCV as can be seen from the chart below.

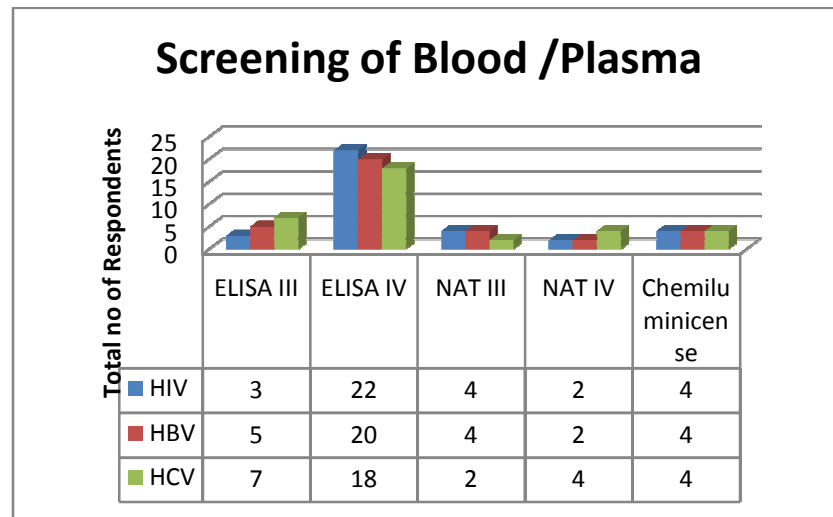


Fig 12. Source: Questionnaire data analysis Q. no 11.

12.Storage of Plasma

83% of the Blood Banks store Plasma in Freezer and 17% store plasma in Blast Freezer.

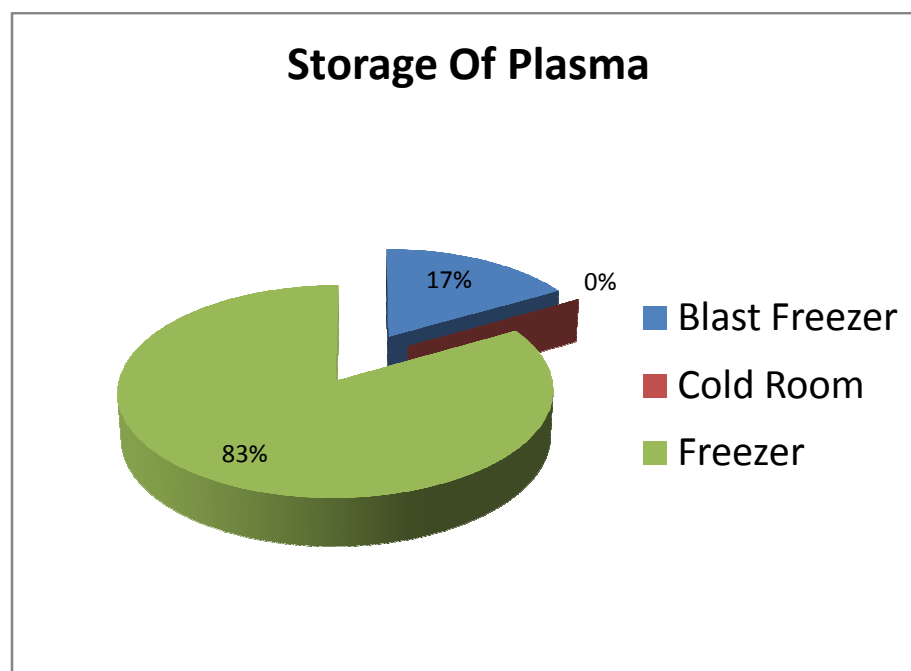


Fig 13. Source: Questionnaire data analysis Q. no 13.

13.Preparation of Cryoprecipitate.

14 Blood Banks were found to prepare Cryoppt.The amount of preparation of Cryoppt. varied from 2-25%.

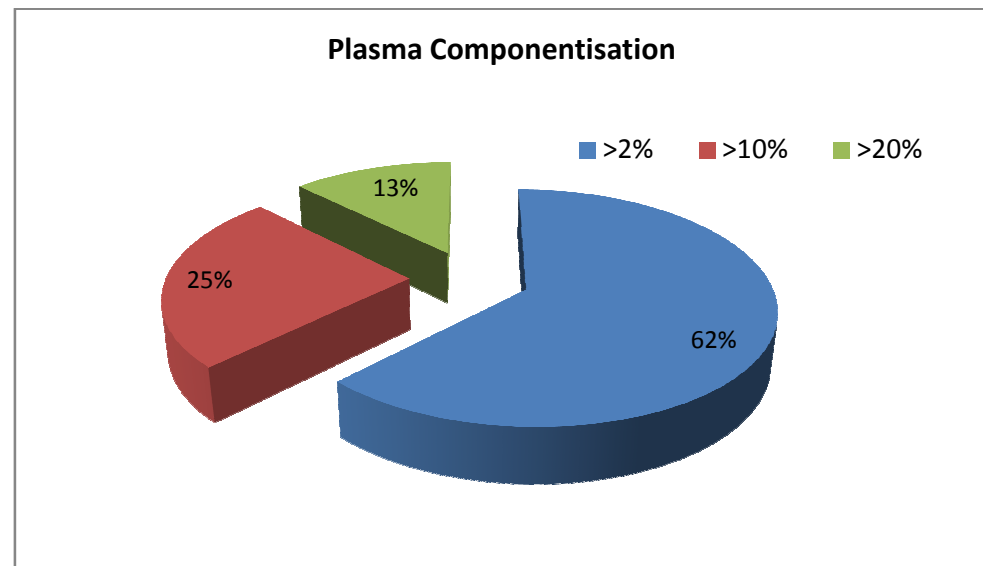


Fig 14.Source: Questionnaire data analysis Q. no14.

14.Capacity for Maximum Storage of Plasma.

42% of the Blood Banks have >500 units of maximum storage capacity in their Blood bank,25% have >2000 units of maximum storage capacity,17% have >1000 units of max. storage capacity,and 8% have>3000 and >5000 units of max. storage capacity.

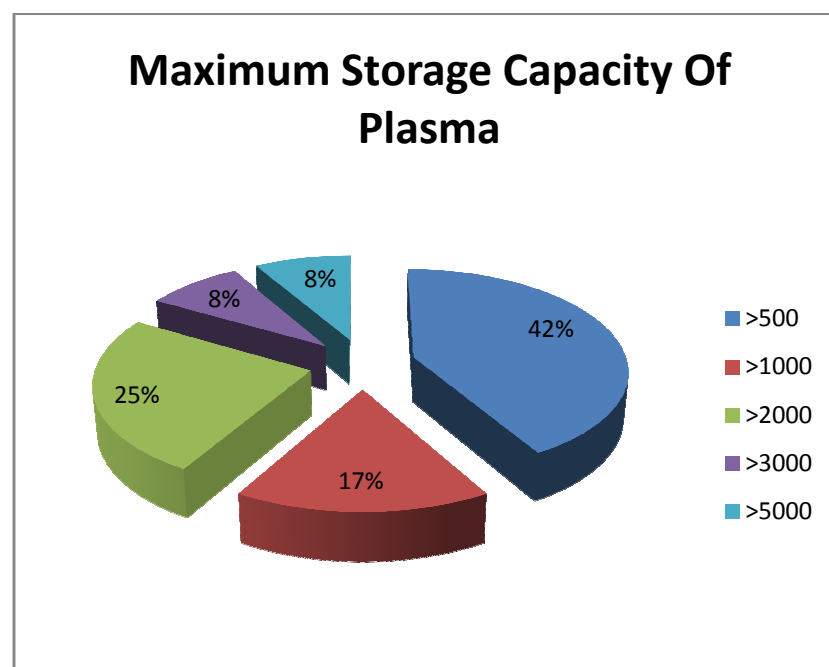


Fig 15.Source: Questionnaire data analysis Q. no 16.

15.Monthly Average Availability of Plasma

47% of the Blood Banks have >250 Units of Plasma available with them monthly, 23% have >1000 units of Plasma available, 18% have >500 Units of Plasma available with them on an average.

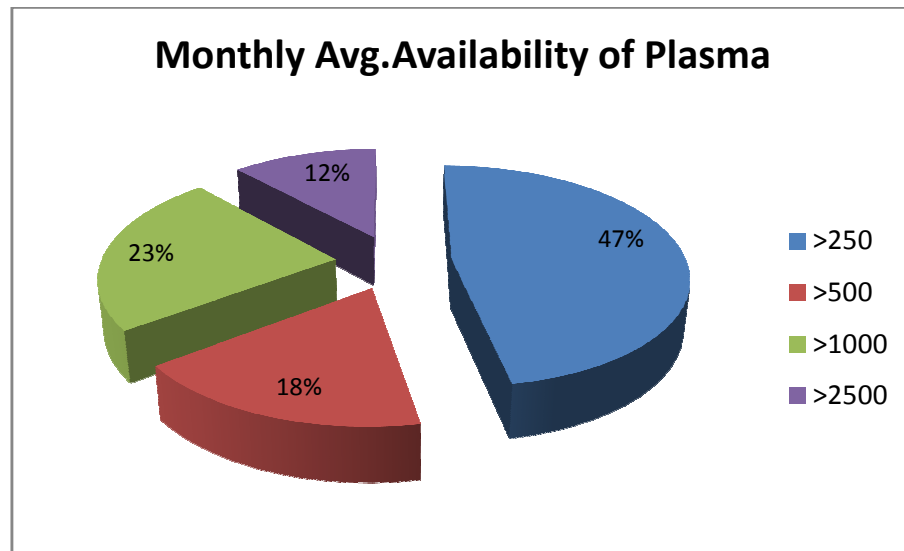


Fig 16.Source: Questionnaire data analysis Q. no 17.

16.Formation Of Consortium.

26 of the 28 Blood Banks suggest that forming a consortium between Blood Banks and Plasma Fractionation Company would help all concerned.

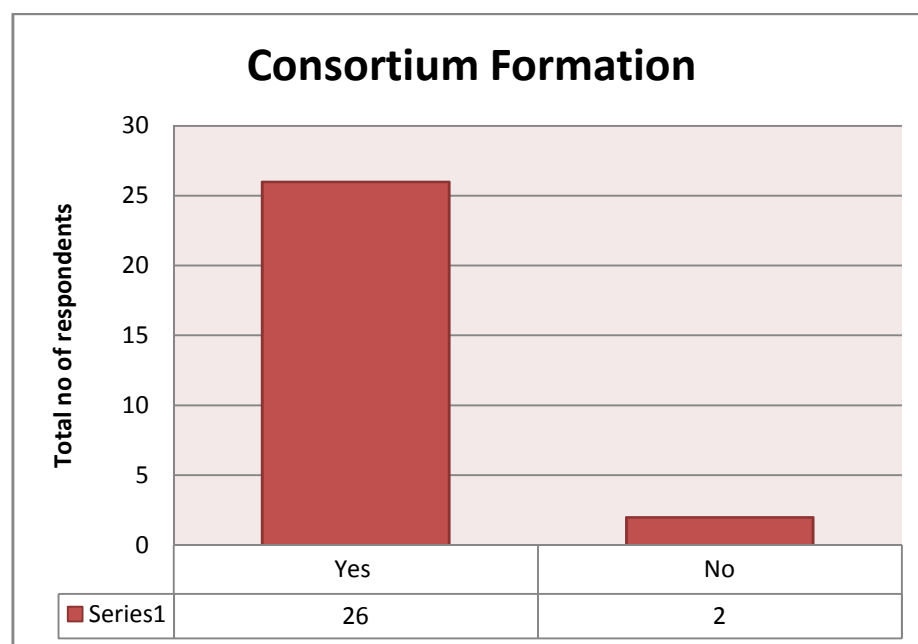


Fig 17. Source: Questionnaire data analysis Q. no 18

17. Utilisation Of Surplus Plasma:

27 of 28 Blood Banks suggest that the surplus plasma available with the blood banks can be utilized for fractionation.

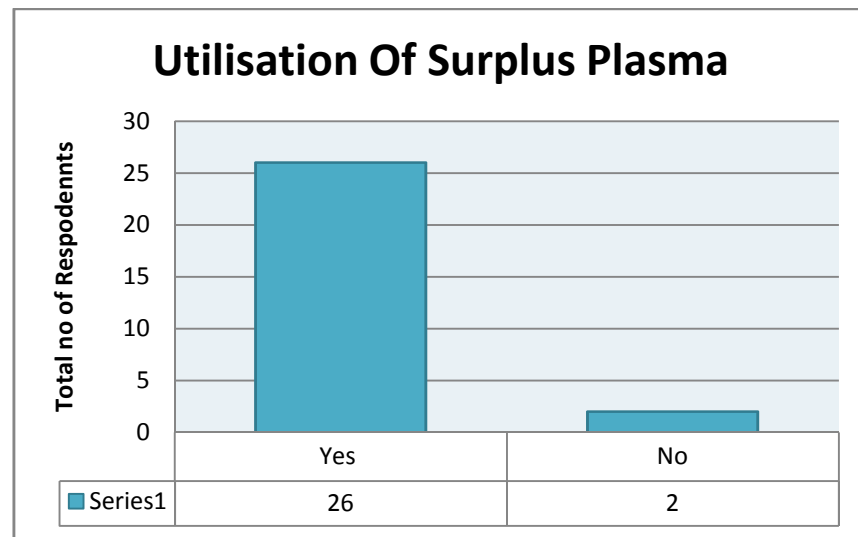


Fig 18. Source: Questionnaire data analysis Q. no 19

18. Plasma for fractionation.

26 of 28 Blood Banks would like to give plasma for fractionation.

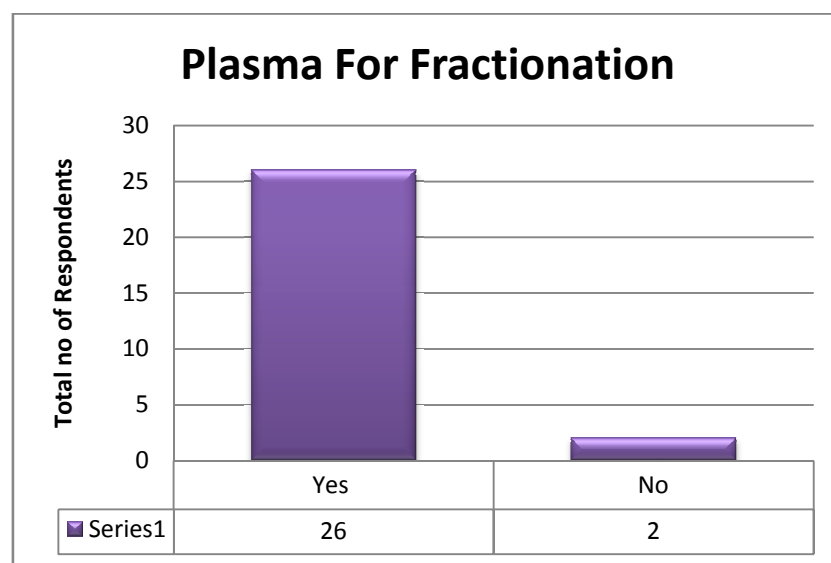


Fig 19. Source: Questionnaire data analysis Q. no 20.

D.FINDINGS AND CONCLUSION

1. The maximum number of Blood Banks were Hospital Associated(55%),followed by govt and Pvt Blood Banks,(17%),and Charitable Blood Banks (11%)
2. 9 Blood Banks had permission to conduct Blood Collection Drives/Camps,20 Blood Banks did not have permission to do so.
3. 48% Blood Banks have License to prepare all products mentioned,28% prepare all products except cryoprecipitate,17% deal with only whole blood and 7% prepare Packed RBCs.
4. 73% of the blood banks had collected <10000 units in the yr 2011-2012.This indicates that sufficient amount of Blood is available with these blood Banks which could be utilized for fractionation.
5. 31% of the Blood Banks are using Single Blood Bag,29% are using Triple Blood Bag,21% Double Blood Bag and 19% are using Quadruple Blood Bag.
6. 41% of the Blood Banks have >10% of Voluntary Blood Collection,21% of the Blood Banks have >50% of Voluntary Blood Collection,17% of the Blood Banks have >70% and >30% of the Total Voluntary Blood collection.This data indicates that maximum units of blood is collected by Voluntary Blood donation.If the general public is encouraged for donating blood the total amount of Blood collected could be increased.
7. 26% of the Blood Banks do 100 % or >90% of the componentization of the total blood collected.18% of the Blood Banks componentise >70 % of the blood collected,17% of the Blood Banks Componentise >40% of the collected blood and 13% of the Blood Banks do 80% componentization of the total blood collected. The maximum amount of blood collected is componentized by the blood banks.

8. 7 Blood Banks issue >50% of the plasma components which they prepare,5 Blood Banks each issue >40% and >90% of the total components prepared.
9. Maximum Screening is done by ELISA IV method for HIV,HBV and HCV as can be seen from the chart below.Total 60 blood Banks have been using this method for screening of Blood.
10. 42% of the Blood Banks have >500 units of maximum storage capacity in their Blood bank,25% have >2000 units of maximum storage capacity,17% have >1000 units of max. storage capacity,and 8% have>3000 and >5000 units of max. storage capacity.
11. 47% of the Blood Banks have >250 Units of Plasma available with them monthly,23% have >1000 units of Plasma available,18% have >500 Units of Plasma available with them on an average.This plasma is either given to Plasma Fractionation company or is either componentized by the blood banks.Most of the Blood Banks were found to supply Plasma to Reliance.
12. 26 of the 28 Blood Banks suggested that forming a consortium between Blood Banks and Plasma Fractionation Company would help all concerned. Thus blood banks could supply the surplus Plasma available with them to the Plasma Fractionation company.
13. 26 of 28 Blood Banks would like to give plasma for fractionation.

E. RECOMMENDATIONS

1. The Company can utilize the surplus plasma available with the Blood Banks as many of the Blood Banks seemed interested in selling off their surplus Plasma as they (blood banks) have been doing so since long.
2. The company can start a awareness program for the general public, explaining them the benefits of Blood Donation. Thus there will be more plasma available for fractionation. This would help all concerned.
3. There exists mind-boggling gender disparity among blood donors. 94 per cent of blood donations in the country are made by men while women contribute only six per cent, as reported in the World Health Organization's (WHO) global database on blood safety updated in June 2011. Therefore women should be encouraged for blood donation.

F. ANNEXURE

F.1 Questionnaire for Blood Banks

PlasmaGen Biosciences Pvt. Ltd

No.160, KCI Chambers, 2nd Floor, 5th Main Road,
Chamarajapet, Bangalore-560018.

Ph: + 91-80-42154535/36/37 Fax: + 91-80 - 421 545 38 Email: info@plasmagen.in

Name of Blood Bank

.....

Name of Doctor

.....

Address.....

.....

City.....**State**.....**PinCode**.....

Ph.No.....**Mobile**.....

Email.....

1. What is the nature of Blood Center?

(a) Govt (b) Charitable (c) Hospital Associated (d) Private/Stand Alone

2. Blood Center License Number and Validity of License?

.....

3. Do you have permission to conduct blood collection drives/camps? If yes, how many drives/camps do you conduct?

.....

4. Your Blood Center is having License to prepare

(a) Packed RBC's (b) Platelets (c) Plasma (d) Cryoprecipitate (e) (f)

5. Total Blood collection (Units) for the Year 2011-2012?

(a) <10000 (b) <15000 (c) <20000 (d) <25000 (e) <30000 (f) <35000 (g) <40000 (h) >40000 (i) >50000 (j) specific.....

6. Total Blood Collected in as percentage:

Blood Bag	Single Bag	Double Bag	Triple Bag	Quadruple Bag
450 ml				
350 ml				

7. Which Company Blood Bag is mostly used for blood collection?

(a) Terumo Pempol (b) Fenwal (c) HLL (d) Mitra Industries (f) specific.....

8. What is the percentage of Voluntary Blood Collection?

(a) 100 (b) >90 (c) >80 (d) >70 (e) >50 (f) specific.....

9. What is the percentage of blood componentization?

(a) 100 (b) >90 (c) >80 (d) >70 (e) >50 (f) specific.....

10. What is the percentage of Issuance of plasma component to patients?

(a) 10 (b) <20 (c) <30 (d) <40 (e) <50 (f) specific.....

(b)

11. Which protocol is followed for screening of Blood/Plasma?

Name of TTI	ELISA III	ELISA (Generation) IV	NAT (Generation) III	Chemiluminiscense IV
HIV				
HBV				
HCV				

12. How many cases individually recorded for all Transfusion-Transmissible Infections?

Year	HIV	HBV	HCV	SYPHILIS	MALARIA
2010-11					
2011-12					

13. How do you prepare and store Plasma?

(a) Blast Freezer (b) Cold Room (c) Freezer

14. Is cryoprecipitate component prepared? If Yes, what percentage?

(a) Yes (b) % of Plasma (c) No

15. Do Hemophilic Patient's approach your blood center for Cryoprecipitate? If Yes, How many patients/Month?

(a) Yes (b) Patients/Month (c) No

16. What is the maximum capacity for storage of plasma at your Blood Center?

(a) > 500 (b) > 1000 (c) > 2000 (d) > 3000 (e) > 5000 units (f) specific.....

17. What is the monthly average availability of surplus plasma units?

(a) > 250 (b) > 500 (c) > 1000 (d) > 2500 (e) Specific

18. Do you think forming a consortium between blood banks and plasma Fractionation Company would help all concerned?

(a) Yes (b) No

19. Do you agree that Surplus plasma available with blood banks can be utilized for fractionation?

(a) Yes (b) No

20. Would your Blood Centre like to give plasma for Fractionation?

(a) Yes (b) No

21. Details of Blood Centre Staff:

Description	No. of Persons	Name and Contact Details
Administration		
Technical		
Non-Technical		

F.1 List of Blood Banks Visited.

S No.	Blood Banks Visited
1	AIIMS CNC, Ansari Road
2	Guru Teg Bahadur Hospital Blood Bank
3	Swami Dayanand Hospital Blood Bank
4	Max Balaji Blood Bank, Patparganj
5	Dr. Hedgewar Arogya Sansthan
6	Saroj Hospital Blood bank
7	blood bank organisation
8	Delhi Heart and Lung Institute Blood Bank
9	Kailash Hospital and Heart Institute Blood Bank
10	International Hospital LTD Blood Bank, Fortis Noida
11	Maharaja Agrasen Blood Bank
12	Holy Family Hospital Blood Bank
13	Escort Heart Institute Blood Bank
14	Kasturba Gandhi Blood Bank
15	Apollo Hospital Blood Bank
16	St Stephens Hospital Blood Bank
17	Emergency Blood Bank
18	Sant Parmanand Hospital Blood Bank
19	Bajaj Blood bank
20	Central Polyclinic Blood Bank
21	Sunil Blood Bank
22	Lok Nayak Hospital Blood Bank
23	G.B. Pant Hospital Blood Bank
24	Baba Saheb Ambedkar Hospital Blood Bank
25	Balaji Action Cancer Hospital Blood Bank
26	Sir Ganga Ram Hospital Blood Bank
27	Ram Manohar Lohia Hospital Blood Bank
28	Mool Chand Medcity Blood Bank
29	Indian Red Cross Society
30	Blood Bank Organisation,
31	Central Polyclinic Blood Bank
32	Aravind Hospital and Research Centre Blood Bank
33	Jaipur Golden Hospital Blood Bank
34	Brahm Shakti Hospital Blood Bank
35	Sanjay Gandhi Memorial Hospital Blood Bank
36	Rajiv Gandhi Memorial Hospital Blood Bank
37	White Cross Blood Bank
38	Batra Hospital Blood Bank
39	National Heart Institute Blood Bank
40	(Pushpawasti Singhania Research Institute) Blood Bank
41	Fortis, Vasant Kunj
42	Mata Chanan Devi Hospital Blood Bank