



Blood donor deferral analysis in relation to the Blood Pre-donation & Screening Process: A retrospective cross-sectional study from Marwari Hospitals' Blood Centre, a tertiary care hospital situated at Sati Jaymati Road, Athgaon, Guwahati 781008 Assam

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Abstract: Donor retention is essential for every blood bank. Hence blood transfusion must be safe and adequate by ensuring proper screening with quality system requirements on donor deferral. This study has been carried out retrospectively cross sectional over a period of 4 years (2018-2021). For giving a resultant framework, the donors' deferral pattern has been categorized on the basis of the reasons for deferral like anaemia and other medical conditions, demographic parameters irrespective of male and female. Screening of donated blood and its deferral has been done on the basis of HIV, HBV, HCV, Syphilis & Malaria.

During the study period, a total number of 19465 donors were listed, and a total number of 2600 donors deferred. The overall deferred rate was 13.35 %. The potential donors were informed at the time of deferral about the cause and duration of deferral so that they can be recruited back to donor pool on correction of the cause of deferral and keep them motivated to donate blood. Awareness on the causes of deferral would lead to early correction and would also allow the prospective donors to pre screen themselves.

The study of the profile of blood donors will help to identify the selection of the donor population for potential voluntary blood donors and also to guide and help in meeting the noble cause of Blood Donation. It will also help in policy design and program implementation.

Key Words: Blood donors, Anaemia, Deferral, Transfusion.

1. INTRODUCTION:

Blood is a fluid connective tissue which comprises plasma, various types of blood cells (WBC's and RBC's) and platelets. The main function of blood is to deliver oxygen and nutrients to various cells and tissues of the body. It is life saving and plays an important role in medicine and surgical practice. It saves critically ill patients. Safe, adequate blood and blood components transfused on timely manner helps in improving healthcare. One should ensure the safety of the donor as well as the recipients. [3,11]

Individuals qualified for donating blood are known as blood donors & the one which are disqualified from donating blood are known as "deferred donors". Donor selection is defined as the process of assessing the suitability of an individual to donate blood or blood components against different selection criteria. It is an important tool for ensuring blood safety.[1,4]

Blood donor selection is an important part of blood safety. The safest blood donors are non remunerated voluntary donors from low risk population. Blood donor suitability criteria are based on science, informed medical opinion and regulatory rules which are designed as per the Drugs & Cosmetics Act 1940 which ensures the safety of blood donors and also the blood recipients. [6,7,9,10]

The aim of blood transfusion is to transfuse safe, adequate blood and blood components on timely manner in improving healthcare.

Marwari Hospitals has the state of art blood centre with component separation facility with the Individual donor Nucleic Acid Testing (ID NAT). It is the latest technological advance in ensuring blood safety. Being a direct test, which targets the viral Deoxyribo Nucleic Acid (DNA)/Ribonucleic Acid (RNA), the ID-NAT greatly reduces the "window period" or the time between donor exposure to a virus and the presence of detectable amount of antibodies/antigens



laboratory. It is a molecular technique for screening blood donations to reduce the risk of transfusion transmitted infections (TTIs) in the recipients. Thus it ensures 100% safety coverage to transfused blood.[15]

Aim:- To evaluate and analyze the blood donor deferral pattern and its causes among blood donors in a tertiary care hospital blood centre and to review its influence on blood safety.

1.1 Objectives :-

1. To study and find out the causes of blood donor deferral
2. To study its influence on blood safety during post donation- screening process.
3. To make blood donors aware about the causes of their deferral leading to early correction.
4. To maintain the pool of potential blood donors

2. METHODOLOGY:

Scope and Limitations of the Study

This retrospective study was conducted over a period of 4years from January 2018 to December 2021 in the M/S Marwari Hospitals Blood Centre (A Unit of Shree Marwari Databya Aushadhalaya), Sati Jaymati Road Athgaon, Guwahati-781008, Assam, India. The study was done on the whole blood donors both voluntary through regular blood donation camps, donor sensitization, awareness campaign in- house and outdoor camps and replacement who came for blood donation.

Materials and Methods

Study Method:- Analysis of donor deferral was performed in relation to the donor screening process, which includes Blood Donor Questionnaire & Consent Form. Each donor was selected by the blood transfusion medical officer based on the detailed medical history and brief physical examination of donor with regard to haemoglobin, weight, blood pressure (BP), body temperature and pulse rate.

Criteria laid down by the Directorate General Health Services and Drug Controller of India are strictly adhered for donor selection and deferral.[4,5,8,9]

Haemoglobin level not less than 12.5g/dl, weight not less than 45kg, age limit between 18 and 65years but in case the donor donates for the 1st time his/her age should be below 55years , systolic blood pressure between 100 and 140mm of Hg, diastolic blood pressure between 60 and 90 mm of Hg and body temperature not more than 37 degree Centigrade, pulse rate between 60-100 per minute are the present standards used for donor selection. Estimation of Haemoglobin was done by using Diaspect -TM and Hemocue method.[2,5,14]

Data Collection : The total nos. of whole blood donors enrolled, accepted and deferred during the study period were recorded. The details of deferred donors and the reasons for deferral, whether temporary or permanent were also recorded. The data required for the study were retrieved from the departmental software. The data obtained was analyzed using Microsoft excel. Data collected from the donor register and blood donor questionnaire were compiled and analyzed. Deferred donors as well as blood were analyzed with respect to gender, causes of deferral. [5,11]

3. DISCUSSION:

A blood bank is a centre where blood is gathered, as a result of blood donation, is stored and preserved for later use in blood transfusion. The term "blood bank" typically refers to a division of a hospital where the storage of blood product occurs and where proper testing is performed (to reduce the risk of transfusion related adverse events). Blood banking includes tasks related to blood collection, processing, testing, separation, and storage. Blood donor selection and deferral criteria play a vital role in blood transfusion safety and are designed to ensure the donor as well as the recipient's health. It is a challenge for blood banks to maintain an adequate blood inventory by conforming to regulatory rules and guidelines, including their amendments. It is a well known fact that donor deferral have a negative impact on donors of both first and repeat. It may discourage potential donors. Hence it is essential to understand the donor deferral reasons and develop effective strategies and retain these already motivated but deferred donors.[2,12] The aim of our study was to devise a protocol that could prevent the loss of precious blood and also to make donations to be safe for the donors and recipients. Female gender contributing very less to the donor pool can be attributed to ignorance, fear, lack of motivation and awareness, socio cultural factors and lesser opportunities among women for blood donation. During blood transfusions, blood donor selection is an essential part of blood safety. The blood bank plays an important role in patient care. Transfusion-related errors have serious consequences for patients, including death. Proper identification of the patient and blood products is critical in avoiding such transfusion-related reactions. [2,4,12]



Blood is required for many reasons such as red blood disorder, white blood disorder, platelets, plasma disorder, excessive blood loss, serious injuries/surgery. A common need for blood donations is after a major disaster causing excessive bleeding such as a road traffic accident or a natural or manmade disaster, maternal haemorrhage etc. The average car accident victim can need as many as 100 pints (4.5 litres) of blood. Blood donations are also needed for casualties of war. Although not necessarily a major injury, blood may also be needed when a large amount of blood is lost through other mechanisms such as surgery. On an average, human body contains approximately 4 to 5 litres blood that can be donated after every third month. Now, everybody has awareness of blood group system and importance of blood donation.[13]

DATA ANALYSIS:

Blood Donors Reported for the period 2018-2021	
Year	No. of blood donors reported
2018	4798
2019	4654
2020	5393
2021	4620
Total	19465

Table no.1

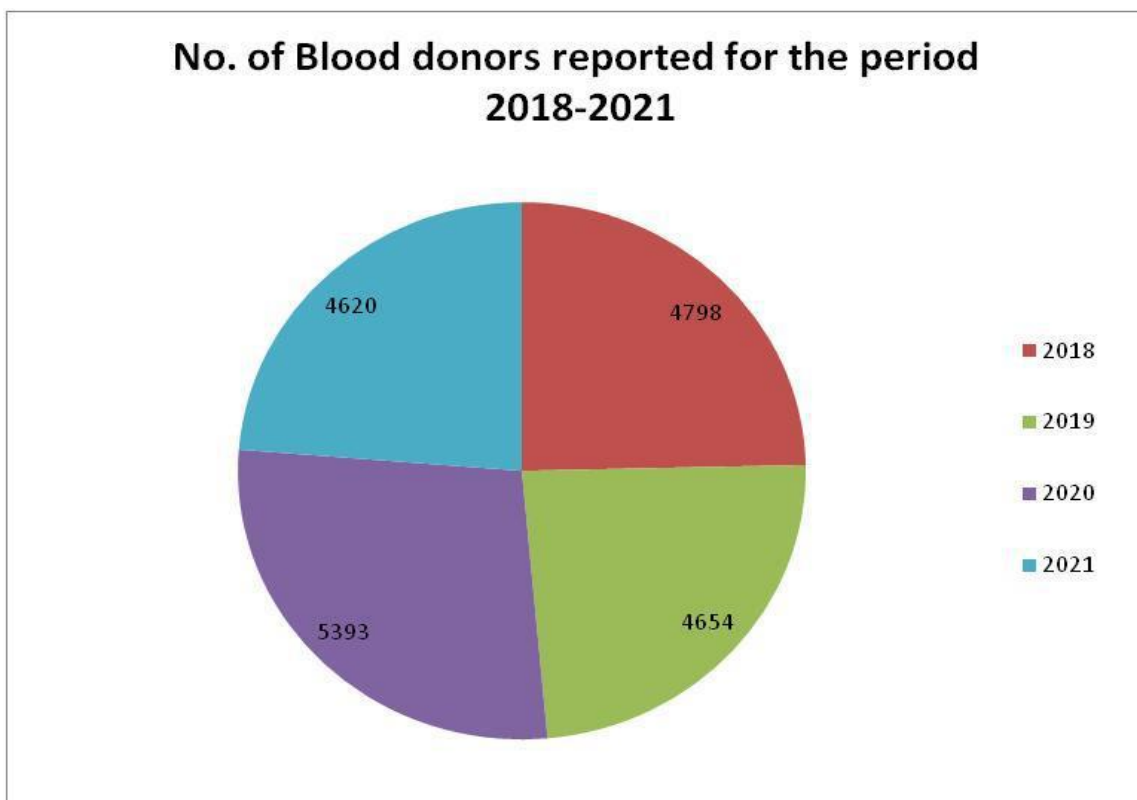


Figure no.1



Blood donor deferral during pre- blood donation process

Blood donor deferral during pre- blood donation process (in % age)				
Year	Male deferral	Deferral in % age	Female deferral	Deferral in % age
2018	463	71%	192	29%
2019	506	68%	240	32%
2020	458	76%	147	24%
2021	428	72%	166	28%
Total deferral	1855	71.35%	745	28.65%
Total deferral in %age	2600 (13.35%)			

Table no.2

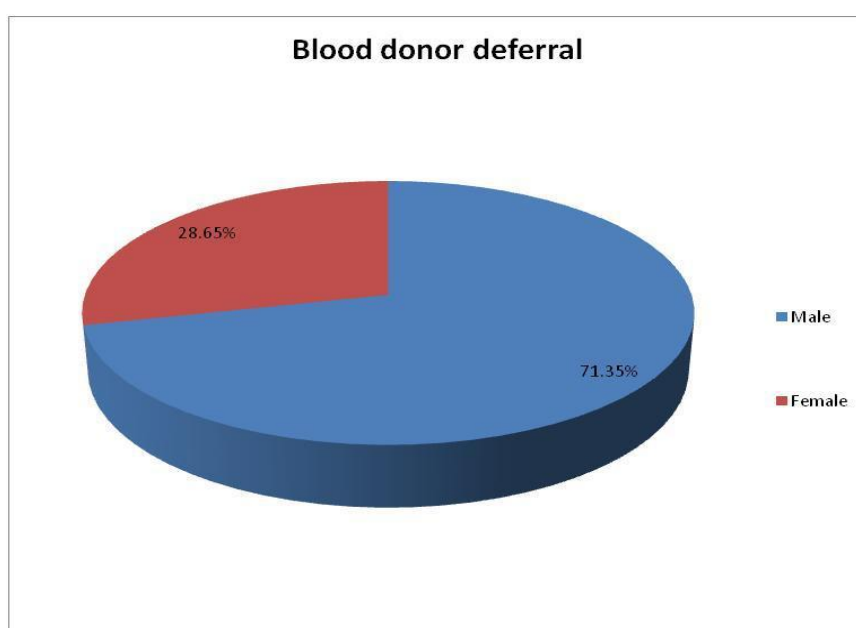


Fig.no.2

Factors for blood donors deferral during pre- blood donation process

Factors for blood donors deferral during pre- blood donation process					
Year	Anaemia	Medical & Surgical	Underweight. & age	Others	Total
2018	478	147	12	18	655
2019	511	169	20	46	746
2020	356	186	9	54	605
2021	270	287	13	24	594
Total deferral	1615	789	54	142	2600
Deferral in %age	62%	30%	2%	6%	

Table no.3



Factors for blood donors deferral during pre- blood donation process (in %age)				
Year	Anaemia	Medical & Surgical	Underweight. & age	Others
2018	73%	22%	2%	3%
2019	68%	23%	3%	6%
2020	59%	31%	1%	9%
2021	46%	48%	2%	4%

Table no.4

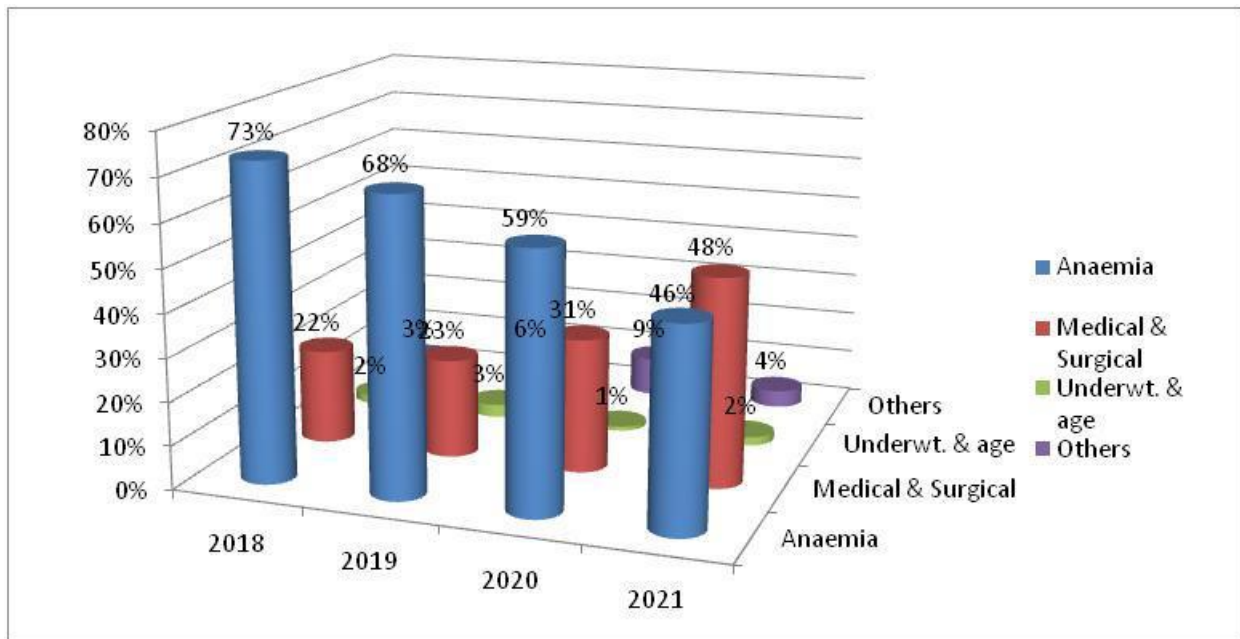


Fig.no.4

The major factor for blood deferral is found to be anaemia. Though it has decreasing trend paving way to other factors such as medical & surgical, underweight & age and others.

Blood Donors

Year	Male donors	Male donors (in% age)	Female donors	Female donors (in % age)	Total Donors
2018	3980	96%	163	4%	4143
2019	3719	95%	189	5%	3908
2020	4600	96%	188	4%	4788
2021	3813	95%	213	5%	4026
Total donors	16112		753		16865
Total donors reported	19465				
Total donors in %age	86.6%				



Table no. 5

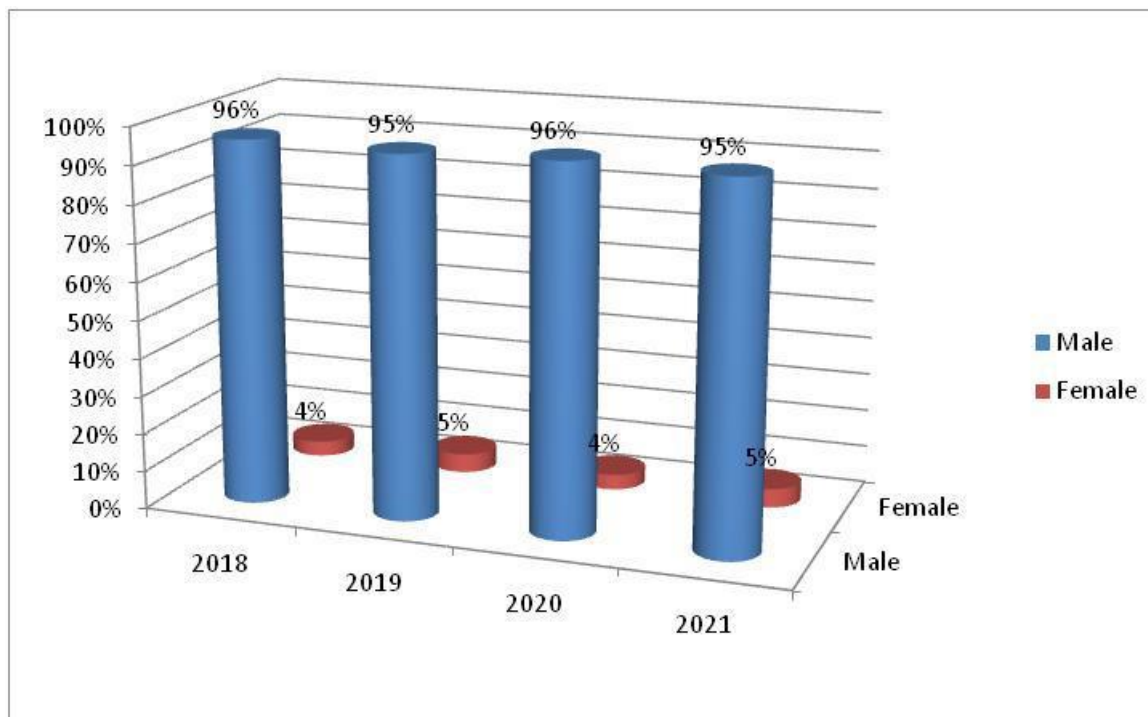


Fig.no.5

Factors for deferral during post blood donation-screening process

Year	No. of reactive donors	No. of reactive donors (in %age)	HIV	HBV	HCV	SYPHILIS	MALARIA
2018	106	2.5%	9%	24%	25%	42%	0%
2019	82	2%	15%	23%	32%	30%	0%
2020	108	2%	21%	23%	38%	18%	0%
2021	103	2.5%	29%	20%	26%	25%	0%
Deferral in % age	399	2%	19%	22%	30%	29%	0%

Table no.6

As far as % age of reactive is concerned, overall it is found to be 2%. The factors for reactivity are found to be HIV, HBV, HCV, and Syphilis. Malaria is found to be nil.

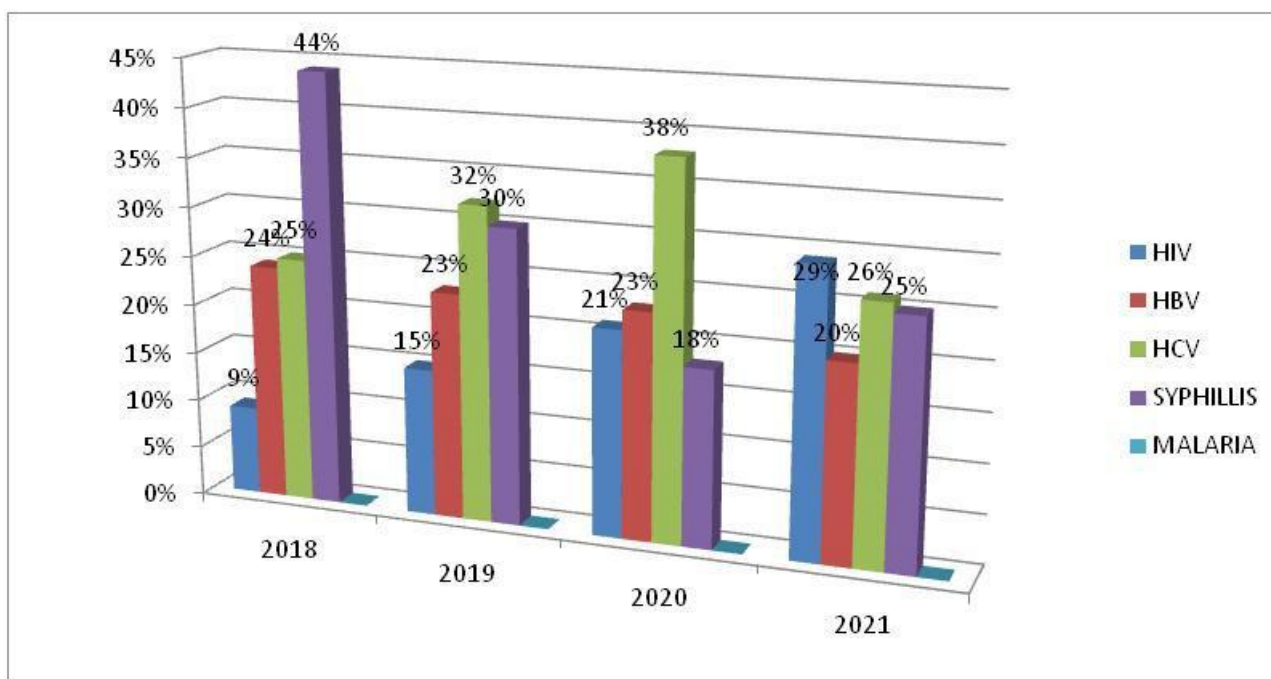


Fig.no.6

In last four years HIV shows increasing trend, HBV has decreasing trend, HCV shows increasing trend in last three years but decreased in 2021, whereas Syphilis showed decreasing trend but increased in 2021. Malaria is found to be nil for the consecutive periods. The major reason for reactivity of blood during screening process is found to be HIV, HBV, HCV & Syphilis.

Causes for blood donor deferral

As per National AIDS Control Organisation (NACO) guidelines, in last six months if the donor has history of having unexplained weight loss, repeated diarrhoea, continuous low grade fever, Swollen glands or if the donor had the following in last six month he/she is debarred from donating blood as medical and surgical factor.

1. Tatoo,
2. Dental extraction
3. Ear piercing
4. Minor surgery
5. Blood Transfusion

If the donor suffer or have been suffering from any of the following diseases he/she is debarred from blood donation.

1. Heart disease	7. Epilepsy	13. Typhoid
2. Lung Disease	8. Diabetes	14. Abnormal bleeding tendency
3. Malignant diseases/Cancer	9. Hepatitis B/C	15. Fainting spells
4. Kidney/Liver disease	10. Allergy	16. Malaria
5. Jaundice	11. Cough/Cold fever	
6. Tuberculosis	12. VD/STD	

Moreover if the donor is taking or have taken Antibiotics, Aspirin, Alcohol, Steroid, Vaccine or in last one year has taken Anti Rabies Vaccine or had any major surgery he/ she shall be debarred.

For Women donors the following factors debar from donating blood:-

1. Pregnancy



2. Having child 1 year of age
3. Had abortion in last three months
4. Have breast feeding child
5. Having menstrual period

4. KEY FINDINGS:

It was a retrospective observational study conducted at a tertiary care hospital ie Marwari Hospitals based blood centre situated in north east region of India from January 2018 to December 2021. During the study following observations were made:-

In 2018, 4798 nos. of blood donors reported, 14% (655) deferred. 71% (463) male and 29% (192) female. The reason for deferred were anaemia 73% (478), medical and surgical 22% (147), underweight & age 2% (12), others 3% (18). 86% (4143) were selected, out of which 96% (3980) male and 4% (163) female. 2.5% (106) were found to be reactive. The factors were HIV 9%, HBV 24%, HCV 25%, Syphilis 42%, Malaria 0%.

In 2019, 4654 nos. of blood donors reported, 16% (746) deferred. 68% (506) male and 32% (240) female. The reason for deferred were anaemia 68% (511), medical and surgical 23% (169), underweight & age 3% (20), others 6% (46). 3908 were selected, out of which 95% (3719) male and 5% (189) female. 2% (82) were found to be reactive. The factors were HIV 15%, HBV 23%, HCV 32%, Syphilis 30%, Malaria 0%.

In 2020 (Pandemic Period), 5393 nos. of blood donors reported, 11% (605) deferred. 76% (458) male and 24% (147) female. The reason for deferred were anaemia 59% (356), medical and surgical 31% (186), underweight & age 1% (9), others 9% (54). 89% (4788) were selected, out of which 96% (4600) male and 4% (188) female. 2% (108) were found to be reactive. The factors were HIV 21%, HBV 23%, HCV 38%, Syphilis 18%, Malaria 0%.

In 2021 (Pandemic Period), 4620 nos. of blood donors reported, 13% (594) deferred. 72% (428) male and 28% (166) female. The reason for deferred were anaemia 46% (270), medical and surgical 48% (287), underweight & age 2% (13), others 4% (24). 87% (4026) were selected, out of which 95% (3813) male and 5% (213) female. 2.5% (103) were found to be reactive. The factors were HIV 29%, HBV 20%, HCV 26%, Syphilis 25%, Malaria 0%.

5. RECOMMENDATIONS:

1. Donor selection should be done through proper counselling. Blood donor counselling is a confidential dialogue between a blood donor and a trained counsellor about issues related to the donor's health and the donation process. This helps in blood deferral by self exclusion and self unit exclusion from the donor's end. Thus, it automatically lessens the number of deferral
2. As per Drug and Cosmetics Act, 1940 NAT testing is not a mandatory screening test. Moreover its high cost and lack of technical expertise have been major obstacles in its implementation. But it has been observed that ID NAT testing is very much safe & secure which helps both the patient and the institution. It provides an additional layer of blood safety.

6. CONCLUSION:

The study conducted from last 4 years showed that there was 13.35% blood donor deferred. Most of the donors deferred because of anaemia (62%) and medical, surgical (30%), underweight & age (2%) & other factors (6%). The reactivity rate was found to be 2%, and the causes were HIV (19%), HBV (22%), HCV (30%), Syphilis (29%). The potential donors were informed at the time of deferral about the causes and duration of deferral so that they can be recruited back to donor pool on correction of the cause of deferral and keep them motivated to donate blood. Awareness on the causes of deferral would lead to early correction and would also allow the prospective donors to pre screen themselves.

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Ethical Approval: The institutional ethical clearance was sought from Marwari Hospitals Ethical Committee. During this study, all the precautions has been taken so as to conduct in an ethical manner and utmost importance had been given to safeguard the interests of the respondents.

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I, Mrs. Kamala Singh Das have been associated with health care industry for last 22years. I am a science graduate with post graduate diploma holder, specialised in Marketing and Human Resource Management. Currently pursuing Master of Business Administration in Hospital Management. I am working as Deputy General Manager at Marwari Hospitals, Guwahati, Assam. I have been handling day to day operational activities. Have also guided Internship Project for students pursuing MBA course in Hospital Management from Assam Down Town University in the year 2019. Has also undertaken course on GOOD CLINICAL PRACTICE conducted by NIDA Clinical Trials Network. I have keen interest in study & research activities related to healthcare and I hope my study will be beneficial in the field of Health Science.