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TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG BETA THALASSEMIA PATIENTS: CHALLENGES AND INSIGHTS

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Abstract
The blood transfusion is the most common procedure in healthcare facilities which saves millions of lives every year. However, it is the main source of disease transmission among the people who undergo this procedure more frequently. The patients suffering from thalassemia are categorized among the most frequent blood recipients. Therefore, the chance of transmitting the transfusion-transmittable Infections (TTIs) such as hepatitis B, hepatitis C, acquired immunodeficiency syndrome, syphilis, and malaria are more common in these patients as compared to others. Due to increasing reports related to the improper pre-transfusion screenings and increasing number of hepatitis B and hepatitis C patients in Pakistan, it seems that the incidence of TTIs is also increasing especially among the patients experiencing multiple transfusions. Therefore, the present project was designed to study the prevalence of TTIs in patients suffering from thalassemia in Faisalabad Pakistan. The total 200 blood samples from beta-thalassemia patients were collected from the Faisalabad region of Pakistan. Male patients were 130 (65%) and females were 70 (35%). The blood group of O+ve has high frequency and rate of infection 47(33.09%) as compare to other ABO blood groups B+ve 40 (28.16%), A+ve 23 (16.19%), B-negative 13 (9.15%), AB+ve 10 (7.04%) and O-negative 07 (4.92%). Similarly, the prevalence rate of HCV was more detected as compare to other TTIs as 111(55.5%). HIV rate was 20 (10%). Malaria Parasites was 7(3.5%), Syphilis was 3 (1.5%) and HBsAg was 01 (0.5%) in beta-thalassemia patients. It also shows the high prevalence rate of infections in the age group of 6-10 years' patients that have transfused blood 50-100 pints 93 (65.49%). So these rate of infections can be controlled by a proper screening of blood and educate people about thalassemia.

Key Words: Blood, Transfusion, Transmittable, Infections, Thalassemia

INTRODUCTION:

Blood transfusion therapy is most commonly used for severe anemia patients due to surgical, obstetric, medical or in organ transplantation conditions. Blood transfusion is safe and beneficial for

the patients when the highly screened blood for different bloodborne pathogens is used to save the life of a patient. (Eboumbou Moukoko et al., 2014)
Blood or its components (PRBCs, Plasma, FFP, Platelets, Buffy coat, Cryo-precipitates, etc.) are used to save many patient's lives. (Sifatullah et al., 2017) On other hand it is also a source of infections that are called blood-borne infections like Hepatitis, HIV, Syphilis, Malarial parasites, etc. (Saeed et al., 2017a) Such kind of diseases are transmitted through blood (blood-borne) like viruses, bacteria, or parasitic depends on the main causative agent. These infections are also known as the Transfusion Transmissible Infections (TTI) because all these infections spread through blood from infected one to another. HCV, HBsAg, and HIV are worldwide problems. (Sadia Sultan MBBS et al., 2016) To minimize the chances of such kind of blood-borne infections different techniques has been proved in chemotherapy aimed to reduce TTIs. For this purpose, different serological tests are done in blood banks like Immunochromatography techniques (ICT), Enzyme-linked immunosorbent assay (ELISA), Polymerase chain reaction (PCR), Nucleic acid testing (NAT) etc.(Pitassi et al., 2015) In past the selection of blood donor was very difficult to minimize the spread of TTIs, but nowadays, by introducing the different serological techniques it's very easy to select a healthy donor. Transfusion Transmissible Infections maybe lead to many new or incipient infection causative agents like an agent that causes the Creutzfeldt Jacob disease (CJD) is transmitted from infected one to healthy individual include in transfusion transmissible infections. (Urwin et al., 2016) When a person is in an immunological window period to donate blood can cause blood-borne infections. So the specific and sensitive immunological tests can help to minimize the risk of TTI. World Health Organization (WHO) has mandated to screen the donor's blood before donation for five tests namely HBsAg, Anti HCV, Anti-HIV, Syphilis and Malarial parasites (Saeed et al., 2015)

Thalassemia

Thalassemia is a genetic disorder that is because of the reduction or absent of globulin protein. The main function of this protein is oxygen transportation in the whole body to perform their normal functions. Each and every red blood cells in our body may comprise about 240-300 millions of hemoglobin molecules. A single molecule of hemoglobin further comprises of 2 subunits like Alpha unit and Beta unit. The presence of both subunits is necessary for the carrying of oxygen to all body cells and tissues. That locus of gene regulatory to build the alpha chains is called the Alpha Globulin Gene Cluster, and correspondingly the beta locus gene produces the Beta gene. The deficiency or missing of such these certain subunits regulates the alpha or beta thalassemia that leads to severe anemia. In 1925 Thalassemia was documented first time by the Detroit physician, Cooley, and Lee. So it's called Cooley's or Mediterranean anemia that causes the ineffective erythropoiesis and anemia. (Khan et al., 2017) Cooley and Lee described the developed splenomegaly and different changes in bones of anemia infants in the age of 1st year. In 1932 George and William defined the Thalassemia is a Greek word that consists of two words "Thalassa" and "aima", Thalassa means sea and aima means blood. (Origa, 2017) It is a Greek term that is based on different pathological changes in anemic patients of Mediterranean region. Genetic characterization of thalassemia was done after 1940. In 1946 it was reported that the body destroyed red blood cells when abnormal hemoglobin produced and led to anemia.

The body tries to produce more red blood cells to compensate for this deficiency. That results in other thalassemia complications in patients like spleen enlargement, bone disorders, and heart problems. In the 1960s, doctors discovered a new way to treat thalassemia and began replacing fresh blood instead of patient blood every month. This method was most commonly used for patients with thalassemia major and is still used to treat the diseases. But, after each passing blood transfusion, the body encountered an increased amount of iron that could not be removed naturally. As a result, most patients with thalassemia died for the same reason. (Barbero et al., 2016) The researchers later discovered the drug named as Desferrioxamine that removes the extra iron from the patient's body and it increases the patient's life. (Sultan et al., 2015)

Types of thalassemia

Hemoglobin normally consists of 4 polypeptide chains (α, β, γ, δ) resulting in bound the oxygen with the hemoglobin molecules and to transport it all over the body. Thalassemias are named as α, β, γ or δ thalassemia, depending on which polypeptide chains are being affected. (Helmi et al., 2017)

a) Alpha Thalassemia

Each human diploid cell on chromosome 16 is consisting of 4 alpha-globin gene. In alpha thalassemia, the synthesis of alpha globulin chains has been impaired and form the gene HbA1 and HbA2. (Seyedifar et al., 2016) Alpha thalassemia is further divided into H disease and alpha thalassemia major. Major alpha thalassemia is very complicated and severe that has been started before birth and so leading to death the effected babies before delivery or after shortly birth. While on the other hand H disease is milder as compare to β thalassemia and have no need to transfuse blood.

b) Beta Thalassemia

The most affected polypeptide chain that is β chain. So-called as β thalassemia. In β thalassemia major both alleles are muted severely on chromosome 11 and are homozygous form. So the synthesis of β chain has been completely stopped. However, β thalassemia minor is heterozygous that results in about 20% less production of the polypeptide. To recompense this decline HbA2 and HbF are more produced. HbA2 is more in β-thalassemia minor while HbF is more in β-thalassemia major. β thalassemia major causes severe hemolysis in patients and is an autosomal recessive disorder. Estimated 3% of worldwide people carry β thalassemia gene. So it's a worldwide problem most common in Mediterranean, India, Pakistan and South Asia. The average life of thalassemia patients is about 10 years. Nowadays thalassemia patients in Pakistan is 90000 to 100000. Annually 6000 children are born with thalassemia, so 5 out of 100 peoples are suffering from thalassemia. In β thalassemia, a minor individual has one abnormal beta-globin gene while in β thalassemia major both beta-globin genes are abnormal. (Rehman et al., 2019) So in β thalassemia major blood transfusion is necessary. In β thalassemia minor physician prescribe iron supplements.

β thalassemia major is a deadly disorder because it is not treated with any medicine but from the last 30 years, the average life of thalassemia major patients can be increased by steady transfusion of blood and iron-chelating treatment with desferrioxamine. To avoid chronic anemia, thalassemia patients require 4-6 pints of blood per month. So the blood transfusion-dependent patients have a greater risk of transfusion transmissible infections. (Madmoli et al., 2017)

Materials and Methods:

Total 200 blood samples were collected from different Beta thalassemia patients from Faisalabad. For blood grouping and blood screening for TTIs 5 ml blood of blood was drawn from thalassemia patients by using aseptic techniques from venipuncture and this blood was aliquoted 2ml in lavender top vile for blood grouping (Forward) and 3ml in red top vile for reverse blood grouping and blood screening for different blood-borne infections like Hepatitis C, Hepatitis B, Human immunodeficiency virus, Syphilis, and Malarial Parasites. Patients were identified by the medical history and by filling the questionnaire.

BLOOD GROUPING.

SAMPLE: -

i.1 ml oxalate/EDTA/Heparin blood in a vial
ii.3ml clotted blood in a test tube.
Both vials and tube were labeled with the number.

Technique: -

(A) FORWARD (cell) GROUPING.
(B) REVERSE (serum) GROUPING.

ELISA for TTIs:

ELISA test was performed for HBsAg, Anti HCV, and Anti HIV while ICT test was performed for Malarial Parasite and Syphilis.

Results:

In our study, total 200 blood samples of beta-thalassemia patients were collected from Faisalabad region, 130 (65%) male and 70 (35%) were female patients, of these 78 (39%) were having the age between 0-5 years, 104 (52%) were of 6-10 years age group, 15 (7.5%) were between the age of 11-15 years and only 3 (1.5%) were having age more than 15 years.

Table 1: Distribution of TTIs in different blood groups

Blood Group	HBsAg	Anti-HCV	Anti-HIV	Syphilis	Malarial Parasites		Total
A +ve	0 0%	19 82.60%	03 13.04%	0 0%	01 4.34%		**23** **16.19%**
B +ve	01 2.5%	34 85%	04 10%	0 0%	01 2.5%		**40** **28.16%**
AB +ve	0 0%	08 80%	02 20%	0 0%	0 0%		**10** **7.04%**
O +ve	0 0%	37 78.72%	06 12.76%	02 4.25%	02 4.25%		**47** **33.09%**
A-Negative	0 0%	02 100%	0 0%	0 0%	0 0%		**02** **1.40%**
B-Negative	0 0%	06 46.15%	05 38.46%	0 0%	02 15.38%		**13** **9.15%**
AB-Negative	0 0%	0 0%	0 0%	0 0%	0 0%		**0** **0%**
O-Negative	0 0%	05 71.42%	0 0%	01 14.28%	01 14.28%		**07** **4.92%**
Total	**01** **0.70%**	**111** **78.16%**	**20** **14.08%**	**03** **2.11%**	**07** **4.92%**		**142**

Table 1, shows the different TTIs in blood groups A+ve, B+ve, AB+ve, O+ve, A-negative, B-negative, AB-negative and O-negative were 23 (16.19%), 40 (28.16%), 10 (7.04%), 47 (33.09%), 02 (1.40%), 13 (9.15%), 0 (0%) and 07 (4.92%) respectively out of total 142. While HBsAg, Anti-HCV, Anti-HIV, Syphilis and Malarial Parasite were as 01 (0.70%), 111 (78.16%), 20 (14.08%), 03 (2.11%) and 07 (4.92%) respectively in different blood groups. So it shows the high prevalence rate of TTIs in blood group O+ve 47 (33.09%) and high prevalence rate of Anti HCV 111 (78.16%) in beta thalassemia patients.

Table 2: Frequency Table for Age Groups

Age Groups	Frequency	Percent	Valid Percent	Cumulative Percent
0-5 years	78	39.0	39.0	39.0
6-10 years	104	52.0	52.0	91.0
11-15 years	15	7.5	7.5	98.5
>15 years	3	1.5	1.5	100.0
Total	200	100.0	100.0	

In the table 2, it shows the frequency of beta-thalassemia patients in different age groups as 78 (39%) in 0-5 years age group, 104 (52%) in 6-10 years age group, 15 (7.5%) in the age group of 11-15 years and 03 (1.5%) in the age group of more than 15 years.

Table 3: Correlation of ABO Blood groups with TTIs

Correlations		ABO	HBsAg	Anti-HCV	Anti-HIV	TP	MP
ABO	**Pearson Correlation**	1	-.034	.046	-.027	.150*	.023
	Sig. (2-tailed)		.629	.514	.709	.034	.743
	N	200	200	200	200	200	200
HBsAg	**Pearson Correlation**	-.034	1	.065	-.023	-.009	-.014
	Sig. (2-tailed)	.629		.357	.747	.902	.850
	N	200	200	200	200	200	200
Anti-HCV	**Pearson Correlation**	.046	.065	1	.231**	.114	.012
	Sig. (2-tailed)	.514	.357		.001	.108	.866
	N	200	200	200	200	200	200
Anti-HIV	**Pearson Correlation**	-.027	-.023	.231**	1	-.040	-.062
	Sig. (2-tailed)	.709	.747	.001		.574	.385
	N	200	200	200	200	200	200
TP	**Pearson Correlation**	.150*	-.009	.114	-.040	1	-.024
	Sig. (2-tailed)	.034	.902	.108	.574		.741
	N	200	200	200	200	200	200
MP	**Pearson Correlation**	.023	-.014	.012	-.062	-.024	1
	Sig. (2-tailed)	.743	.850	.866	.385	.741	
	N	200	200	200	200	200	200

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3, shows the low negative correlation for HBsAg and Anti-HIV for ABO blood groups and low positive correlation for Anti-HCV, Syphilis and Malarial Parasites in Pearson correlation while in Sig. (2-tailed) Syphilis results are significant and results of HBsAg, Anti-HCV, Anti-HIV, and Malarial Parasites are non-significant.

Table 4: Correlation of Age (0-5 Years) with TTIs

Correlations		Age	HBsAg	Anti-HCV	Anti-HIV	TP	MP
Age	**Pearson Correlation**	1	.[a]	.216	.[a]	.[a]	-.108
	Sig. (2-tailed)		.	.058	.	.	.346
	N	78	78	78	78	78	78
HBsAg	**Pearson Correlation**	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.		.	.	.	.
	N	78	78	78	78	78	78
Anti-HCV	**Pearson Correlation**	.216	.[a]	1	.[a]	.[a]	.104
	Sig. (2-tailed)	.058	.		.	.	.366
	N	78	78	78	78	78	78
Anti-HIV	**Pearson Correlation**	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.		.	.
	N	78	78	78	78	78	78
TP	**Pearson Correlation**	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.		.
	N	78	78	78	78	78	78
MP	**Pearson Correlation**	-.108	.[a]	.104	.[a]	.[a]	1
	Sig. (2-tailed)	.346	.	.366	.	.	
	N	78	78	78	78	78	78

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

Table 4, represents the low positive correlation for Anti-HCV and low negative correlation for Malarial Parasites in Pearson Correlation. While in Sig. (2-tailed) the results ts are non-significant for Anti-HCV and for Malarial Parasites for the age group 0-5 year.

Table 5: Correlation of Age (6-10 Years) with TTIs

Correlations		Age	HBsAg	Anti-HCV	Anti-HIV	TP	MP
Age	Pearson Correlation	1	-.091	.121	.184	.[a]	.205*
	Sig. (2-tailed)		.360	.221	.061	.	.037
	N	104	104	104	104	104	104
HBsAg	Pearson Correlation	-.091	1	.066	-.034	.[a]	-.022
	Sig. (2-tailed)	.360		.508	.733	.	.823
	N	104	104	104	104	104	104
Anti-HCV	Pearson Correlation	.121	.066	1	.094	.[a]	-.045
	Sig. (2-tailed)	.221	.508		.344	.	.651
	N	104	104	104	104	104	104
Anti-HIV	Pearson Correlation	.184	-.034	.094	1	.[a]	-.077
	Sig. (2-tailed)	.061	.733	.344		.	.435
	N	104	104	104	104	104	104
TP	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.		.
	N	104	104	104	104	104	104
MP	Pearson Correlation	.205*	-.022	-.045	-.077	.[a]	1
	Sig. (2-tailed)	.037	.823	.651	.435	.	
	N	104	104	104	104	104	104

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

Table 5 represents a low negative correlation for HBsAg and low positive correlation for Anti-HCV, Anti-HIV and Malarial Parasites in the age group of 6-10 years. While Sig. (2-tailed) results are significant for Malarial Parasites and non-significant for HBsAg, Anti-HCV, and Anti-HIV.

Table 6: Correlation of Age (11-15 Years) with TTIs

Correlations		Age	HBsAg	Anti-HCV	Anti-HIV	TP	MP
Age	Pearson Correlation	1	.[a]	.[a]	-.020	.260	.[a]
	Sig. (2-tailed)		.	.	.944	.349	.
	N	15	15	15	15	15	15
HBsAg	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.		.	.	.	.
	N	15	15	15	15	15	15
Anti-HCV	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.		.	.	.
	N	15	15	15	15	15	15
Anti-HIV	Pearson Correlation	-.020	.[a]	.[a]	1	-.367	.[a]
	Sig. (2-tailed)	.944	.	.		.179	.
	N	15	15	15	15	15	15
TP	Pearson Correlation	.260	.[a]	.[a]	-.367	1	.[a]
	Sig. (2-tailed)	.349	.	.	.179		.
	N	15	15	15	15	15	15
MP	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.	.	
	N	15	15	15	15	15	15

a. Cannot be computed because at least one of the variables is constant.

Table 6 shows the low negative correlation for Anti-HIV and low positive correlation for Syphilis in the age group of 11-15 years. While in Sig. (2-tailed) it shows non-significant results for Anti-HIV and for Syphilis. N represents 15 samples.

Table 7: Correlation of Age (>15 Years) with TTIs

Correlations		Age	HBsAg	Anti-HCV	Anti-HIV	TP	MP
Age	**Pearson Correlation**	1	.[a]	.[a]	.991	-.381	.[a]
	Sig. (2-tailed)		.	.	.084	.751	.
	N	3	3	3	3	3	3
HBsAg	**Pearson Correlation**	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.		.	.	.	.
	N	3	3	3	3	3	3
Anti-HCV	**Pearson Correlation**	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.		.	.	.
	N	3	3	3	3	3	3
Anti-HIV	**Pearson Correlation**	.991	.[a]	.[a]	1	-.500	.[a]
	Sig. (2-tailed)	.084	.	.		.667	.
	N	3	3	3	3	3	3
TP	**Pearson Correlation**	-.381	.[a]	.[a]	-.500	1	.[a]
	Sig. (2-tailed)	.751	.	.	.667		.
	N	3	3	3	3	3	3
	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.	.	
	N	3	3	3	3	3	3

a. Cannot be computed because at least one of the variables is constant.

Table 7 represents the low positive correlation for Anti-HCV and low negative correlation for Malarial Parasites in Pearson Correlation. While in Sig. (2-tailed) the results are non-significant for Anti-HCV and for Malarial Parasites for the age group 0-5 year.

DISCUSSION

Thalassemia is a genetic disorder that is transferred from parents to children. In this disease hemoglobin chains are disturbed and can't work normally. So patients having thalassemia disease need blood or its components transfusion after every month to live normally but infected and unscreened blood is the main source of blood-born infections like HBsAg, HCV, HIV, Syphilis and Malaria parasites. (Thein, 2017)

In our study, total 200 blood samples of beta-thalassemia patients were collected from Faisalabad region, 130 (65%) male and 70 (35%) were female patients, of these 78 (39%) were having the age between 0-5 years, 104 (52%) were of 6-10 years age group, 15 (7.5%) were between the age of 11-15 years and only 3 (1.5%) were having age more than 15 years.

After testing of ABO blood grouping, found that 44 (22%) were A, 68 (34%) were having B, 18 (9.0%) were having AB, while 70 (35%) were of O blood groups. Out of total when Rh grouping done found 21 (10.5%) were negative blood groups and 179 (89.5%) were positive blood groups, that shows the frequency rate of HCV in beta-thalassemia patients is about 111(55.5%), HIV is about 20 (10%), Malarial Parasites infected are 07 (3.5%), Syphilis is 03 (1.5%) and HBsAg is 01 (0.5%) out of total. These infectious diseases were more common in blood group O+ve 47 (33.09%), B+ve have 40 (28.16%), A+ve have 23 (16.19%), B-negative have 13 (9.15%), AB+ve has 10 (7.04%) and O-negative has 07 (4.92%) blood born infections. It also has been studied, the spread of infectious diseases also depends on a number of blood transfusions. It has been analyzed that 20 (14.08%) infections were transmitted in thalassemia patients that have transfused <50 pints of blood, 93

(65.49%) were transmitted through 50-100 pints of blood, 24 (16.90%) were transmitted by blood 100-150 pints of blood while 05 (3.52%) were transmitted through blood of >150 pints of blood.
The study reported on thalassemia explained the total 206 thalassemia patients admitted in Ahvaz Shafa Hospital during the period of March 2006 to April 2007 were 28.1% positive for Anti-HCV. While the prevalence rate of HCV in Arabic states were 33-67.3% and our study showed 55.5% rate of HCV infection. (Boroujerdnia et al., 2009) In England, the prevalence rate of HBsAg related to blood transfusion was 0.57% from 1991 to 1997 that is about related to our present study showed the HBsAg prevalence rate is about 0.5% in thalassemia patients who were transfused blood. (Hussain et al., 2008) According to the study that was reported from Pakistan by Hussain, et al. showed the prevalence rate of HCV was 41.7% in beta-thalassemia patients from January 2002 to December 2003. (Ataei et al., 2012) In the study of Isfahan, HCV positive patients were 8% from total of 466 beta-thalassemia from 1996 to 2011. In the study that was reported from Egypt by Shaker O, et al. explained the HCV rate was 25%, while HBsAg rate was 32.5% in beta-thalassemia patients. (Shaker et al., 2012) In Gujrat, a study was conducted in a tertiary care hospital by Bhavsar H, et al. on 100 thalassemia patients and reported that HCV in those patients was 18%, HBsAg was 6% and HIV infection was 9%. (Valizadeh et al., 2015) While different studies conducted from India represents the HIV prevalence rate is 0-9.3% in beta-thalassemia patients that is very near to our study results 10% of HIV. Another study on beta-thalassemia patients from India was reported that HCV patients were 23.1%, hepatitis B was 2.8%, and HIV was 2.38% by ELISA out of 462 thalassemia patients that have transfused blood multiple times. In Iran, a study was conducted by Tamaddoni A, et al. from the Amirkola thalassemia center Babol, showed the HCV reactive cases were 10.6%. (Tamaddoni et al., 2007) In Pakistan, Ansari S, et al. conducted a study on thalassemia patients showed the HBsAg infection was 1.25%, Anti-HCV was 13.1% and Anti-HIV infections were 0% from 160 thalassemia patients. (Ansari et al., 2012) The study conducted in Urmia, explained no presence of HBsAg, Anti-HCV and Anti-HIV infections in thalassemia patients after 36 transfusions, it was only due to transfusion of high quality screened blood and blood components.
Belayet Hossain, et al. also reported that out of 320 thalassemia patients, HCV reactive cases were 14.7% and male was 54.3% and 45.7% females were selected.(Hossain et al., 2018)
Many other studies had reported a high prevalence rate of HCV in thalassemia patients as compare to others. All provinces of Pakistan represent different prevalence rate of HCV as 6.7% in Punjab, 5% in Sindh, 1.5% in Baluchistan and 1.1% in Khyber Pakhtunkhwa. 3-5% careers of HBsAg also reported in Pakistan. (Raja & Janjua, 2008) UNAIDS Pakistan in 2009 has reported an an average of 130,000 HIV cases was present in Pakistan that was less than 0.05%. All kinds of transfusion transmissible infections spread through blood. WHO encouraged the safety of blood that depends on its source. (Emmanuel et al., 2013)

Conclusion:

This data shows that the spread of these transfusion transmissible infections are more common in the age group of 6-10 years 104 (52%) as compare to other age groups and the frequency rate of HCV 111(55.5%) is more common in all age groups of thalassemia patients that received blood from multiple places. Similarly, if we discuss blood groups the infection rate is too high in blood group O+ve 47 (33.09%) as compared to other blood groups. The number of thalassemia patients is also found low after the age of 10 years because the average life of thalassemia patient is 8-10 years.

Recommendations:

In Faisalabad, Pakistan the trend of cousin marriages is very high, so it leads to an increase the number of thalassemia patients and they need blood or blood products to survive. Infected and unscreened blood is the main source of these transfusion transmissible infections in thalassemia patients that is an extra burden of diseases in those patients and this lead to reduce the average life of such patients and produce more complications. We should educate people about thalassemia and its complications and our government should make strategies to diagnose proper transfusion transmissible infections

and provide latest instruments and high-quality diagnostic kits to eliminate such kind of infection for increasing the average life of thalassemia patients

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