The Prevalence of Transfusion-Transmissible Infection in Blood Donors in Thammasat University Hospital between 2007-2012

Nichapa Chiamchanya BSc*

** Blood Bank Unit, Allied Health Sciences Department, Thammasat University Hospital, Pathumthani, Thailand*

Background: *Due to the campaign for increasing amount of blood donation, a safe blood donation strategy is an important goal to serve clinical use in medical practice.*

Objective: *Study the prevalence of transfusion transmitted infections in donated blood after the well-planned safe blood donation strategy.*

Material and Method: *Retrospective data of blood donation to the Blood Bank Unit of Thammasat University Hospital, between 2007 and 2012 was reviewed and studied the trend after the implementation of a well-planned safe blood donation strategy in 2010. This strategy included well planned active campaign, donor selection and screening process. The blood was analyzed according to age, sex, first time blood donation, and repeated blood donation, for transfusion transmitted infection by using CMIA for HIV, HBsAg, HCV, and Syphilis. Sequential test was done for NAT for HIV, HBV, and HCV. The data were analyzed by percentage and Chi-square test.*

Results: *The amount of blood donation increased 83.18%, from 7,792 units in 2007 to 14,273 units in 2012, including an increase of 314% at the mobile site donation. The increasing amounts were donated from the lower positive prevalence groups:- repeated blood donors, female blood donors, 17 to 20 years old first time blood donors in greater proportion than the higher positive prevalence groups ($p<0.001$). Prevalence of infection-donated-blood decreased in the last three years (2010 to 2012), compared to the first three years (2007 to 2009), 0.14-0.18%, 0.52-0.82%, 0.10-0.17%, and 0.21-0.32% vs. 0.26-0.28%, 0.97-1.42%, 0.26-0.42%, and 0.35-0.53% for HIV, HBsAg, HCV, and Syphilis respectively ($p<0.001$). Prevalence of infection-donated-blood also decreased in all groups in the last three years, compared to the first three years ($p<0.001$). Prevalence of repeated donation from previous-positive-infectious-markers-blood-donors also decreased.*

Conclusion: *The increasing amount of blood donation with decreasing prevalence of transfusion transmitted infection indicates a well planned active campaign, an improving donor selection and screening strategy in safe blood donation service.*

Keywords: *Blood donation, Prevalence of HIV, HBsAg, HCV, Syphilis*

J Med Assoc Thai 2014; 97 (10): 1055-63
Full text. e-Journal: *http://www.jmatonline.com*

People in Thailand give more blood than ever after the massive campaign. The increasing amount of blood donated must be safe to serve clinical use. Therefore, having a good safe blood donation strategy is an important issue. The prevalence of transfusion transmitted infection of donated blood is the critical indices of safe of blood donation.

The standard infectious markers screening tests for blood donation documented by the National Blood Centre, Thai Red Cross Society include anti-HIV1/2 and HIVp24 antigen for human immunodeficiency virus (HIV), HBsAg for hepatitis B virus (HBV), anti-HCV for hepatitis C virus (HCV) using Enzyme linked immunosorbent assay (ELISA) technique, Venereal Disease Research Laboratories (VDRL), Rapid Plasma Reagin (RPR), or Treponema Pallidum Hemagglutination Assay (TPHA), and Syphilis antibodies using ELISA technique for Syphilis. Additionally, using nucleic acid amplification technology (NAT) is used for HIV, HBV, and HCV in the negative serology screening test unit, as a sequential test[1].

The Blood Bank Unit of Thammasat University Hospital, a branch of the National Blood Centre, Thai Red Cross Society, provides blood donation services for both on-site and mobile site. The positive result of screening tests for HIVAg/Ab, HBsAg, anti-HCV, and Syphilis using Chemiluminescence

Correspondence to:
Chiamchanya N, Blood Bank Unit, Allied Health Sciences Department, Thammasat University Hospital, Kong Nung, Kong Luang, Pathumthani 12120, Thailand.
Phone & Fax: 0-2926-9124
E-mail: nichapa41@hotmail.com

Microparticle Immunoassay (CMIA) of the donor blood sample would be repeatedly tested by using the same methods for the blood from both sample-tube and intravenous line. A positive test report would be done after the results of both tests were positive, which indicated an infected blood unit. That blood unit would be discarded and destroyed. The positive infectious marker blood donor would be notified not to give further donation and counseled. Every unit that had negative result would be tested using nucleic acid amplification technology (NAT) for HIV, HBV, and HCV.

The prevalence of positive infectious markers in general population depends on various factors such as age, sex, behavior, culture, life style, location[2-9,12,15-19,20-34]. There were reports of lower prevalence of positive infectious markers in some groups, such as the repeated blood donor that had been verified by the previous blood donation[2,3,5,10-12,19,21,27,29], the female donor due to less behavioral risk[2-5,7,8,30], and the younger age group (17 to 20 years old) due to less exposure[2,3,5,7,12,24]. The objectives of the present study are to study the prevalence of transfusion transmitted infection of the donated blood in the Blood Bank Unit of Thammasat University Hospital between 2007 and 2012. We analyzed the trend after implementing the in-service well-planned active blood donation strategy and the improvement in donor selection process in 2010.

Material and Method

The retrospective study was done from the data record of the Blood Bank Unit of Thammasat University Hospital between 2007 and 2012 with the approval of the ethical committee, Faculty of Medicine Thammasat University. The data included age, sex, first time donation, repeated blood donation, site of donation (blood bank or mobile site), and the results of infectious marker tests including anti-HIV, HIVAg, HBsAg, Anti-HCV, and TPHA by using CMIA, and HIV, HBV, and HCV by using NAT.

The in-service well-planned active blood donation strategy has been implemented since 2010. It included the co-operation with Pathumthani Province Red Cross Teamwork to provide intensive motivation campaigns in low positive prevalence infectious disease populations such as young age group between 17 and 20 years old, female, repeated blood donor, a selection of site that the target group usually had activity or easily joined such as the big department store center (Future Park), and a selection of time that provided convenience for donation, such as holidays or in the afternoon period. The improvement in donor selection process have also been launched since 2010, including pre-donation counseling using self-selected information sheets in combination with intensive screening interview for the donors and using the blood bank deferral registry data record to identify the ineligible donors before any blood drawn.

The number of blood donation each year was summarized, but due to the big flood in Pathumthani province in the last trimester of 2011, there was no blood donation service during that time. The blood donation service has resumed operation again on the first trimester of 2012.

Statistical analysis

Data were reported in frequency and percentage. The comparison was analyzed by Chi-Square test for trend at significant level of 0.05 with SPSS version 17.

Results

The amount of blood donations in the last three years, between 2010 and 2012 increased from 8,609 to 14,273 units, which was an even bigger increase than the first three years, between 2007 and 2009 that increased from 6,090 to 7,792 units. This was because of the increasing amount of mobile site donations, which more than offset the decrease in blood bank donations (Table 1). Therefore, the ratio of mobile site donations and blood bank donations in the last three years was reversed from the first three years (Fig. 1).

The ratio of repeated blood donations and first-time blood donations in the last three years (69.83% vs. 30.17% to 75.93% vs. 24.07%) statistically

Table 1. Blood donation collected during 2007-2012

Year	Units	Site of collection	
		Blood bank Number units (%)	Mobile sites Number units (%)
2007	7,792	5,047 (64.77)	2,745 (35.23)
2008	6,090	3,780 (62.07)	2,310 (37.93)
2009	7,205	3,770 (52.32)	3,435 (47.68)
2010	9,520	3,289 (34.55)	6,231 (65.45)
2011	8,609	2,297 (26.68)	6,312 (73.32)
2012	14,273	2,904 (20.35)	11,369 (79.65)
Total	53,489	21,087 (39.42)	32,402 (60.58)

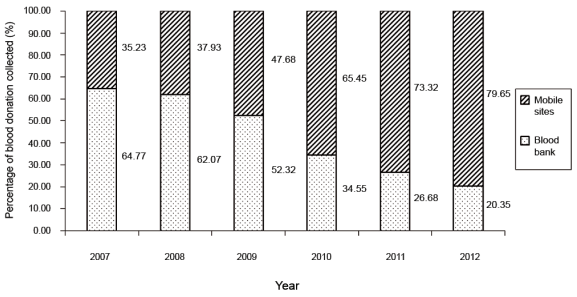

Fig. 1 Trend of blood donation collected in both sites during 2007-2012.

significant increased from the first three years (71.68% vs. 28.32% to 74.37% vs. 25.63%) (p<0.001).

The proportion of female blood donations in the last three years (43.77 to 48.51%) increased from the first three years (37.39 to 42.93%), whereas the proportion of male blood donations in the last three years (56.23 to 51.49%) decreased from the first three years (62.61 to 57.07%), although both of them increased in amounts. This made the female/male blood donation ratio increased in the last three years compared to the first three years with statistical significance (p<0.001) (Table 2).

The age group of 17 to 20 years old, which was the highest proportion of the first-time blood donor age group, distribution in the last three years (47.21 to 51.19%) increased from the first three years (44.31 to 49.89%) with statistical significance (p<0.001) (Table 3).

In the present study, we found 114 units of blood were donated from 82 repeated serology positive blood donors in six years, gradually decreasing in the number of blood units and the donors. It started from 37 units in 29 donors in 2007 to 12 units in nine donors in 2012 (Table 4). The repeated serology positive blood donations in mobile site (106 units, 92.98%) were more than in the blood bank (8 units, 7.02%), showed in Table 5.

There was no HIVAg positive in 53,489 blood donors in this study. There was also no HIV, HBV,

Table 2. Percent of total units collected from various types of blood donors during 2007-2012

Year	Number Total units	First time donors Number units (%)	Repeat donors Number units (%)	Male donors Number units (%)	Female donors Number units (%)
2007	7,792	2,207 (28.32)	5,585 (71.68)	4,447 (57.07)	3,345 (42.93)
2008	6,090	1,561 (25.63)	4,529 (74.37)	3,813 (62.61)	2,277 (37.39)
2009	7,205	1,952 (27.09)	5,253 (72.91)	4,424 (61.40)	2,781 (38.60)
2010	9,520	2,872 (30.17)	6,648 (69.83)	5,353 (56.23)	4,167 (43.77)
2011	8,609	2,072 (24.07)	6,537 (75.93)	4,433 (51.49)	4,176 (48.51)
2012	14,273	3,491 (24.46)	10,782 (75.54)	7,679 (53.80)	6,594 (46.20)
Total	53,489	14,155 (26.46)[a]	39,334 (73.54)[a]	30,149 (56.36)[b]	23,340 (43.64)[b]

[a, b] p<0.001

Table 3. Age distribution in first time blood donors during 2007-2012

Year	Number Total	17-20 years		21-30 years		31-40 years		41-60* years	
		Number	(%)	Number	(%)	Number	(%)	Number	(%)
2007	2,207	1,101	49.89	495	22.43	404	18.30	207	9.38
2008	1,561	727	46.57	389	24.92	270	17.30	175	11.21
2009	1,952	865	44.31	466	23.87	380	19.47	241	12.35
2010	2,872	1,356	47.21	643	22.39	541	18.84	332	11.56
2011	2,072	992	47.88	491	23.69	409	19.74	180	8.69
2012	3,491	1,787	51.19	855	24.49	602	17.24	247	7.08
Total	14,155	6,828	48.24**	3,339	23.59**	2,606	18.41**	1,382	9.76**

* There were only 31, 36, 39, 34, 29 and 39 blood donors in 51-60 age group in 2007, 2008, 2009, 2010, 2011 and 2012 respectively

** p<0.001

Table 4. Repeat donations from previous positive infectious markers blood donors

Year	HIV		HBV		HCV		Syphilis		Total	
	Donor	Unit	Donor	Unit	Donor	Unit	Donor	Unit	Donor	Unit
2007	4	6	6	10	10	12	9	9	29	37
2008	4	5	4	6	2	4	3	6	13	21
2009	3	4	3	3	3	5	3	5	12	17
2010	3	3	1	2	4	4	2	5	10	14
2011	3	3	2	2	2	4	2	4	9	13
2012	2	2	1	2	1	3	5	5	9	12
Total	19	23	17	25	22	32	24	34	82	114

HIV = human immunodeficiency virus; HBV = hepatitis B virus; HCV = hepatitis C virus

Table 5. Repeat blood donation from previous infected blood donors donate at hospital blood bank and mobile site during 2007-2012

Location	Positive blood donation for (unit)				Total	%
	HIV	HBV	HCV	Syphilis		
Hospital blood bank	0	4	3	1	8	7.02
Mobile site	23	21	29	33	106	92.98
Total	23	25	32	34	114	100

and HCV positive by NAT in the negative CMIA screening units. The prevalence of HIV, HBV, HCV, and Syphilis in blood donors in the last three years (0.14 to 0.18%, 0.52 to 0.82%, 0.10 to 0.17%, and 0.21 to 0.32%, respectively) decreased from the first three years (0.26 to 0.28%, 0.97 to 1.42%, 0.26 to 0.42%, and 0.35 to 0.53%, respectively) with statistical significance (p<0.001) (Fig. 2).

The prevalence of HIV, HBV, HCV, and Syphilis in the first-time blood donors in the last three years (0.49 to 0.53%, 2.06 to 2.65%, 0.32 to 0.53%, and 0.52 to 1.16%, respectively) decreased from the first three years (0.63 to 0.77%, 3.43 to 4.58%, 0.77 to 1.18% and 1.02 to 1.45%, respectively) with statistical significance (p<0.001) (Fig. 3).

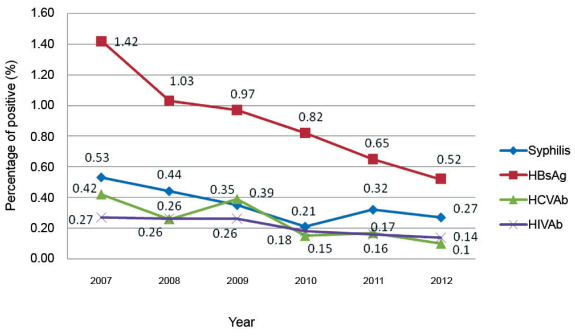

Fig. 2 Trends of positive infectious markers screening in donated blood during 2007-2012.

The prevalence of HIV, HBV, HCV, and Syphilis in the repeated blood donors in the last three years (0.02 to 0.05%, 0.02 to 0.03%, 0.03 to 0.06%, and 0.05 to 0.08%, respectively) decreased from the first three years (0.08 to 0.11%, 0.06 to 0.18%, 0.09 to 0.21%, and 0.10 to 0.16%, respectively) with statistical significance (p<0.001) (Fig. 3).

The prevalences of HIV, HBV, HCV, and Syphilis in the male blood donors in six years of study (0.20 to 0.37%, 0.83 to 1.89%, 0.12 to 0.56%, and 0.26 to 0.67%, respectively) were higher than in the female blood donors (0.07 to 0.18%, 0.15 to 0.81%, 0.07 to 0.32%, and 0.14 to 0.33%, respectively) with statistical significance (p<0.001) (Fig. 4).

The prevalence of HIV, HBV, HCV, and Syphilis in the male blood donors in the last three years (0.20 to 0.25%, 0.83 to 1.29%, 0.12 to 0.20%, and 0.26 to 0.47%, respectively) decreased from the first three years (0.32 to 0.37%, 1.36 to 1.89%, 0.29 to 0.56%, and 0.38 to 0.67%, respectively) with statistical significance (p<0.001) (Fig. 4).

The prevalence of HIV, HBV, HCV, and Syphilis in the female blood donors in the last three years (0.07 to 0.10%, 0.15 to 0.34%, 0.07 to 0.14%, and 0.14 to 0.17%, respectively) decreased

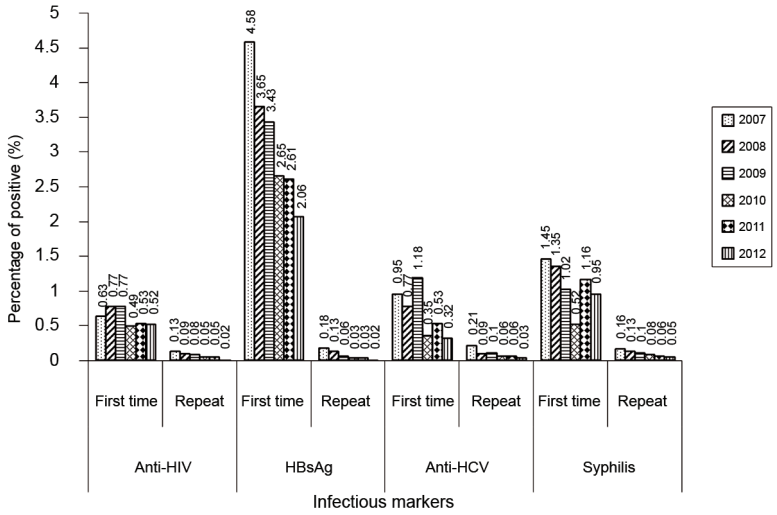

Fig. 3 Prevalence of infectious markers among first time blood donation and blood donations from repeat donors.

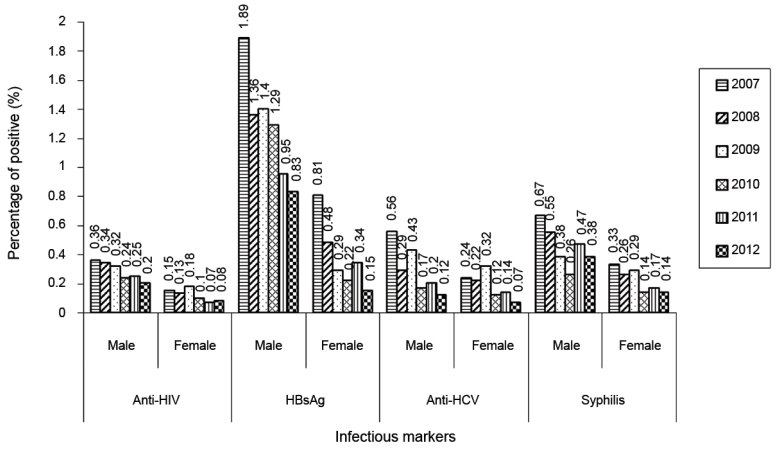

Fig. 4 Prevalence of infectious markers in blood donation from male and female blood donors.

from the first three years (0.13 to 0.18%, 0.29 to 0.81%, 0.22 to 0.32%, and 0.26 to 0.33%, respectively) with statistical significance (p<0.001) (Fig. 4).

The prevalence of HIV, HBV, HCV, and Syphilis in the age group of 17 to 20 years old first-time blood donors (0.18%, 2.36%, 0.37%, and 0.47%, respectively) were the lowest of all first-time blood donors age groups (p<0.001) (Fig. 5).

The prevalence of all infectious diseases increased with the age of the first-time blood donors with statistical significance (p<0.001), except the prevalence of HBV, which was reversed between the age group of 21 to 30 years old first-time blood donors (3.71%) and the age group of 31 to 40 years old first-time blood donors (3.30%) with statistical significance (p<0.001) (Fig. 5).

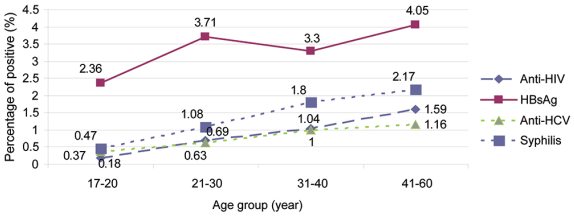

Fig. 5 Prevalence of infectious markers among different age groups of first time blood donors.

Discussion

The present study showed the amount of blood donation of the Blood Bank Unit of Thammasat University Hospital increased 83.18% from 7,792 units in 2007 to 14,273 units in 2012. The donations from the mobile site markedly increased by about 314%

(Table 1, Fig. 1). This was the result of the new implementation of active blood donation strategy in the cooperation with a well-planned campaign of Pathumthani Province Red Cross Teamwork. The present study also showed that the safety of the blood donation with the new improvement in donor selection processes was the most important aspect apart from the increasing amount of blood donation. The results were a decreasing prevalence of positive of all four infectious markers (HIV, HBsAg, HCV, and Syphilis) in donated blood in the last three years (2010 to 2012) compared to the first three years (1997 to 1999) (Fig. 2). The present study showed that the new strategic blood donation program paid attention to the target groups with lower prevalence of infectious diseases such as the repeated blood donor, the female blood donor, and the younger age group between 17 and 20 years old. This is also shown in the other studies[2-5,7,8,12,19,21,24,27,29]. The result of the present study showed that the percentages of the amounts of blood donation from these target groups increased more than the percentages of the amounts of blood donated from the groups with higher prevalence of infectious diseases, such as the first time blood donor, the male blood donor, and the older age groups, in the last three years compared to the first three years (Table 2, 3 and Fig. 3-5).

The present study also showed that the surveillance system to prevent repeated donation from previous positive infectious markers blood donors was effective in the six years of study (Table 4), but there was still more prevalence in the mobile site (Table 5). This may be due to the inadequate data in donor selection process, or the screening process in the mobile site that was not sensitive enough. This could require further improvement[13,14].

The present study also showed that the prevalence of all positive infectious markers in all groups of blood donors such as the first-time blood donor, the repeated blood donor, the male blood donor, the female blood donor, and the first-time blood donor with different age groups decreased in the last three years when compared to the first three years. However, the decline in the lower positive prevalence groups (those had been described) was more than the higher positive prevalence groups. These may be due to decrease prevalence of the infectious diseases in the general population[5,16,21,32-35], or the result of the well-planned campaign with effective heath education for blood donor, such as the intensive motivation of low infectious disease prevalence population, young age group-first-time blood donor motivation, the comprehensive education of self-healthcare, and decreased behaviors at risks in regular blood donors. The combination of the improvement in donor selection and screening process, such as pre-donation counseling, self-evaluation, and intensive screening interview for the donor, and using the blood bank deferral registry data record[5,12,15,17,19,20,27-32,36,37] may have help reaching this goal. For the post-donation blood screening test, the present study also confirmed the negative results in every blood unit by using NAT for HIV, HBV, and HCV to insure the safety of donated blood. There was a report of breakthrough transmissions after NAT screening[38], which made the donor selection even more important. This sequential testing is cost-effective in high prevalence of transfusion transmitted infection area[23].

Conclusion

With the increasing amount of blood donation, the prevalence of transfusion transmitted infection could be minimized by the intensive recruitment of lower infectious disease prevalence blood donors, including the repeated blood donor, the female blood donor, and the first-time blood donor young age group of 17-20 years old. A well-planned active blood donation strategy, and improving donor selection and screening processes are a great procedures to lower the risk.

What is already known on this topic?

Safe blood donation is the important goal in blood donation service. Repeat blood donors, female blood donor, and young-age group have low prevalence of transfusion transmitted infection.

What this study adds?

This study presented how to recruit safe blood donors in the blood donation service. Well-planned active blood donation campaign with intensive motivation of low prevalence transfusion transmitted infection population group is the key process in increasing safe blood donation. Improvement of donor selection process is the important step in safe blood donation.

Acknowledgement

The author wants to thank Dr. Srivilai Tanprasert for the valuable advice, and Assistant Professor Dr. Junya Pataraarchachai for assisting on statistical analysis.

Potential conflicts of interest

None.

References

1. Thai Red Cross Society, Ministry of Public Health. National blood policy 2010. Bangkok: Agricultural Credit Cooperatives of Thailand Publishers; 2010.
2. Sawdang K, Urwijitaroon Y. Prevalence of HIV, HBV, HCV and Syphilis infections among blood donors: surveillance for improvement of blood donor recruitment. J Hematol Transfus Med 2012; 22: 83-91. [in Thai]
3. Nuchprayoon T, Chumnijarakij T. Risk factors for hepatitis B carrier status among blood donors of the National Blood Center, Thai Red Cross Society. Southeast Asian J Trop Med Public Health 1992; 23: 246-53.
4. Ratanasuwan W, Sonji A, Tiengrim S, Techasathit W, Suwanagool S. Serological survey of viral hepatitis A, B, and C at Thai Central Region and Bangkok: a population base study. Southeast Asian J Trop Med Public Health 2004; 35: 416-20.
5. Nantachit N, Robison V, Wongthanee A, Kamtorn N, Suriyanon V, Nelson KE. Temporal trends in the prevalence of HIV and other transfusion-transmissible infections among blood donors in northern Thailand, 1990 through 2001. Transfusion 2003; 43: 730-5.
6. Songsivilai S, Jinathongthai S, Wongsena W, Tiangpitayakorn C, Dharakul T. High prevalence of hepatitis C infection among blood donors in northeastern Thailand. Am J Trop Med Hyg 1997; 57: 66-9.
7. Pattoom W, Urwijitaroon Y, Pattoom P, Padsan S, Leelayuwat C, Kuaha K. Prevalence of HIV, HBV and HCV infections in first time blood donors at Somdejphrachaotaksin Maharaj Hospital, Tak Province during 2001-2005. Thai J Hematol Transfus Med 2008; 18: 101-7.
8. Yussara M, Leelayuwat C, Urwijitaroon Y, Barusrux S, Promwong J, Tadein R. Prevalence of hepatitis virus infections in the first donating blood donors at the regional Yala Hospital during 2001-2005. J Med Tech Phys Ther 2007; 19: 16-24.
9. Mahaprom C. Seroprevalence of hepatitis B virus among personnel of Maharaj Nakorn Chiang Mai Hospital, Thailand. Chiang Mai Med Bull 2006; 45: 11-8.
10. Pongpun S, Poolkesorn S, Kesudom W, Plipat T. Trend of HIV prevalence in Thailand 2007. W Epidemiol Surveill Rep 2008; 39: 789-94.
11. Pongpun S, Poolkesorn S, Kesudom W, Plipat T. Trend of HIV prevalence in Thailand 2007. W Epidemiol Surveill Rep 2009; 32: 533-43.
12. Watanabe KK, Williams AE, Schreiber GB, Ownby HE. Infectious disease markers in young blood donors. Retrovirus Epidemiology Donor Study. Transfusion 2000; 40: 954-60.
13. Soloslikit W, Sripanithan R, Vienghok P. The effectiveness of counseling for reducing repeated donation among hepatitis infected blood donors in Phrae Hospital. Thai J Hematol Transfus Med 2010; 20: 11-7.
14. Urwijitaroon Y. Donor selection: Strategy for reduction of transfusion risk. Thai J Hematol Transfus Med 2007; 17: 145-53.
15. Pallavi P, Ganesh CK, Jayashree K, Manjunath GV. Seroprevalence and trends in transfusion transmitted infections among blood donors in a university hospital blood bank: a 5 year study. Indian J Hematol Blood Transfus 2011; 27: 1-6.
16. Grgicevic D, Balija M, Pirc-Tiljak D, Mihaljevic I, Gjenero-Margan I, Zupancic-Salek S, et al. Decreasing risk of viral transfusion-transmitted diseases in Croatia. Croat Med J 2000; 41: 191-6.
17. Schmunis GA, Zicker F, Segura EL, del Pozo AE. Transfusion-transmitted infectious diseases in Argentina, 1995 through 1997. Transfusion 2000; 40: 1048-53.
18. Aydin F, Cubukcu K, Yetiskul S, Yazici Y, Kaklikkaya N. Retrospective evaluation of HBsAg, anti-HCV, anti-HIV and syphilis reagin antibody seropositivity in blood donors at the Trabzon Farabi Hospital. Mikrobiyol Bul 2002; 36: 85-90.
19. Salles NA, Sabino EC, Barreto CC, Barreto AM, Otani MM, Chamone DF. The discarding of blood units and the prevalence of infectious diseases in donors at the Pro-Blood Foundation/Blood Center of Sao Paulo, Sao Paulo, Brazil. Rev Panam Salud Publica 2003; 13: 111-6.
20. Mathai J, Sulochana PV, Satyabhama S, Nair PK, Sivakumar S. Profile of transfusion transmissible infections and associated risk factors among blood donors of Kerala. Indian J Pathol Microbiol 2002; 45: 319-22.
21. Zou S, Notari EP, Stramer SL, Wahab F, Musavi F, Dodd RY. Patterns of age- and sex-specific prevalence of major blood-borne infections in United States blood donors, 1995 to 2002: American Red Cross blood donor study. Transfusion 2004; 44: 1640-7.

22. Mutlu B, Meric M, Willke A. Seroprevalence of hepatitis B and C virus, human immunodeficiency virus and syphilis in the blood donors. Mikrobiyol Bul 2004; 38: 445-8.
23. Singh B, Kataria SP, Gupta R. Infectious markers in blood donors of East Delhi: prevalence and trends. Indian J Pathol Microbiol 2004; 47: 477-9.
24. Bhatti FA, Ullah Z, Salamat N, Ayub M, Ghani E. Anti-hepatits B core antigen testing, viral markers, and occult hepatitis B virus infection in Pakistani blood donors: implications for transfusion practice. Transfusion 2007; 47: 74-9.
25. Bhattacharya P, Chandra PK, Datta S, Banerjee A, Chakraborty S, Rajendran K, et al. Significant increase in HBV, HCV, HIV and syphilis infections among blood donors in West Bengal, Eastern India 2004-2005: exploratory screening reveals high frequency of occult HBV infection. World J Gastroenterol 2007; 13: 3730-3.
26. Nantachit N, Thaikruea L, Thongsawat S, Leetrakool N, Fongsatikul L, Sompan P, et al. Evaluation of a multiplex human immunodeficiency virus-1, hepatitis C virus, and hepatitis B virus nucleic acid testing assay to detect viremic blood donors in northern Thailand. Transfusion 2007; 47: 1803-8.
27. Kalibatas V. Payment for whole blood donations in Lithuania: the risk for infectious disease markers. Vox Sang 2008; 94: 209-15.
28. Khedmat H, Fallahian F, Abolghasemi H, Alavian SM, Hajibeigi B, Miri SM, et al. Seroepidemiologic study of hepatitis B virus, hepatitis C virus, human immunodeficiency virus and syphilis infections in Iranian blood donors. Pak J Biol Sci 2007; 10: 4461-6.
29. Diarra A, Kouriba B, Baby M, Murphy E, Lefrere JJ. HIV, HCV, HBV and syphilis rate of positive donations among blood donations in Mali: lower rates among volunteer blood donors. Transfus Clin Biol 2009; 16: 444-7.
30. Shrestha AC, Ghimire P, Tiwari BR, Rajkarnikar M. Transfusion-transmissible infections among blood donors in Kathmandu, Nepal. J Infect Dev Ctries 2009; 3: 794-7.
31. Kaur G, Basu S, Kaur R, Kaur P, Garg S. Patterns of infections among blood donors in a tertiary care centre: a retrospective study. Natl Med J India 2010; 23: 147-9.
32. Durro V, Koraqi A, Saliasi S. Trends in the prevalence of transfusion-transmissible infections among blood donors in Albania. Clin Lab 2010; 56: 591-5.
33. Cheraghali A. Overview of blood transfusion system of iran: 2002-2011. Iran J Public Health 2012; 41: 89-93.
34. Li C, Xiao X, Yin H, He M, Li J, Dai Y, et al. Prevalence and prevalence trends of transfusion transmissible infections among blood donors at four Chinese regional blood centers between 2000 and 2010. J Transl Med 2012; 10: 176.
35. Poolkasorn S, Namwat C, Thangkreur W, Namwong T, Sangwanloy O. Situation of HIV infection in Thailand in 2011 [Internet]. 2012 [cited 2013 Mar 1]. Available from: www.boe.moph.go.th
36. Gimble JG, Friedman LI. Effects of oral donor questioning about high-risk behaviors for human immunodeficiency virus infection. Transfusion 1992; 32: 446-9.
37. van den Burg PJ, Vrielink H, Reesink HW. Donor selection: the exclusion of high risk donors? Vox Sang 1998; 74 (Suppl 2): 499-502.
38. Nubling CM, Heiden M, Chudy M, Kress J, Seitz R, Keller-Stanislawski B, et al. Experience of mandatory nucleic acid test (NAT) screening across all blood organizations in Germany: NAT yield versus breakthrough transmissions. Transfusion 2009; 49: 1850-8.

ความชุกของอัตราการติดเชื้อในเลือดของผู้บริจาคโลหิตในโรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ ระหว่าง พ.ศ. 2550-2555

ณิชาภา เจียมจรรยา

ภูมิหลัง: การเพิ่มปริมาณการรับบริจาคโลหิต ควบคู่กับมาตรการการจัดหาโลหิตที่ปลอดภัย เป็นเป้าหมายสำคัญของการบริการโลหิตในการรักษาทางการแพทย์

วัตถุประสงค์: การทำให้ความชุกของอัตราการติดเชื้อในเลือดที่รับบริจาคลดลง เป็นดัชนีชี้วัดที่สำคัญของการจัดหาโลหิตที่ปลอดภัย

วัสดุและวิธีการ: การศึกษาข้อมูลการบริจาคโลหิต ระหว่าง พ.ศ. 2550 ถึง พ.ศ. 2555 ของงานธนาคารเลือด โรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ ซึ่งมีการใช้มาตรการเชิงรุกในการจัดหาโลหิตที่มีการวางแผนเป็นอย่างดี ร่วมกับการพัฒนาขบวนการคัดเลือกและตรวจคัดกรองผู้บริจาคโลหิตที่มีประสิทธิภาพ ตั้งแต่ พ.ศ. 2553 โดยวิเคราะห์ข้อมูลด้านอายุ เพศ ผู้บริจาคโลหิตครั้งแรก ผู้บริจาคโลหิตรายเก่า ผลการตรวจการติดเชื้อ HIV, HBsAg, HCV และ Syphilis แล้วคำนวณความชุกของอัตราการติดเชื้อ และเปรียบเทียบโดยใช้สถิติ Chi-square ทดสอบ

ผลการศึกษา: ปริมาณการบริจาคโลหิตเพิ่มขึ้นถึงร้อยละ 83.18 จาก 7,792 ยูนิต ใน พ.ศ. 2550 เป็น 14,273 ยูนิต ใน พ.ศ. 2555 โดยเฉพาะอย่างยิ่งจากหน่วยรับบริจาคนอกสถานที่ เพิ่มขึ้นถึง ร้อยละ 314 ปริมาณการบริจาคโลหิตเพิ่มขึ้นจากกลุ่มผู้บริจาคที่มีความชุกของอัตราการติดเชื้อต่ำ เช่น ผู้บริจาคโลหิตรายเก่า ผู้บริจาคโลหิตเพศหญิง ผู้บริจาคโลหิตครั้งแรกที่มีอายุ 17-20 ปี ในอัตราส่วนที่มากกว่า กลุ่มที่มีอัตราการติดเชื้อสูง ($p<0.001$) แนวโน้มความชุกของอัตราการติดเชื้อในเลือดที่รับบริจาคลดลงในช่วง 3 ปีหลัง (พ.ศ. 2553-2555) เมื่อเปรียบเทียบกับ 3 ปีแรก (พ.ศ. 2550-2552) ทั้ง HIV, HBsAg, HCV และ Syphilis มีดังนี้ ร้อยละ 0.14-0.18, 0.52-0.82, 0.10-0.17 และ 0.21-0.32 จากร้อยละ 0.26-0.28, 0.97-1.42, 0.26-0.42 และ 0.35-0.53 ตามลำดับ ($p<0.001$) แนวโน้มความชุกของอัตราการติดเชื้อต่าง ๆ ในเลือดที่รับบริจาคจากผู้บริจาคโลหิตแต่ละกลุ่ม ต่างก็ลดลงในช่วง 3 ปีหลัง เมื่อเปรียบเทียบกับในช่วง 3 ปีแรก ($p<0.001$) นอกจากนี้ปริมาณการรับบริจาคโลหิตซ้ำจากผู้บริจาคโลหิตที่เคยตรวจพบว่าติดเชื้อก็ลดลง

สรุป: การรับบริจาคโลหิตที่เพิ่มขึ้นควบคู่กับโลหิตที่รับบริจาคมีการติดเชื้อลดลง บ่งชี้ถึงกระบวนการจัดหาโลหิต ซึ่งมีมาตรการคัดเลือกและการตรวจคัดกรองผู้บริจาคโลหิตที่มีประสิทธิภาพและมีความปลอดภัย