



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1301135>Available online at: <http://www.iajps.com>

Research Article

**STUDY TO KNOW PREOPERATIVE ANEMIA EFFECTS AND
ITS RESULTS AFTER CARDIAC SURGERY**¹Dr. Hira Shahzad, ²Dr. Tooba Jalees, ³Dr. Sana Hadia Qaiser¹Women Medical Officer DHQ Narowal²Mayo Hospital Lahore³WMO IRHC/Trauma Center, Lalamusa, Gujrat**Abstract:**

Objective: It is known that good anemic control in the preoperative period reduces mortality and morbidity after cardiac surgery. For this reason, we examined the effect of preoperative anastomosis on outcome after cardiac surgery.

Study Design: A comparative prospective observational study.

Materials and Methods: This study was performed in Lahore on March 31, March 1, 2012, at Punjab Cardiology Institute. Two hundred consecutive patients underwent cardiac surgery (ischemic / valvular) between ≥ 18 years were selected for study. All surgeries were performed with cardiopulmonary bypass (CPB) and hospital results were recorded.

Results: Of the 200 patients, 140 (70%) were male and 60 (30%) were female. Mean age of the patients was 50.63 ± 15.33 years, mean hemoglobin level was 12.20 ± 1.98 mg / dl. 132 (66%) and 68 (34%) patients underwent valvular surgery with coronary revascularization grafting (CABG). The prevalence of anemia was 114 (57%). (CABG: 15.0 ± 6.38 vs 7.93 ± 4.7 and valve, 17.28 ± 8.65 general 07.05 ± 5.31) associated with prolongation of hospital stay, postoperative level of creatinine, (CABG, 2.87 ± 0.16 vs 0.98 0.61 and valve $\pm 2.76 \pm 0.16$ vs 0.86 ± 0.14) and blood transfusion (CABG increase rate: 1.67 ± 0.98 vs. 1.26 ± 0.60 and valve, 1.65 ± 1.07 vs 1.14 ± 1.06 in patients undergoing cardiac surgery). Preoperative anemic patients were more likely to have negative results after cardiac surgery. postoperative wound infection (3.03% and 2.94%), renal failure (19.69% and 10.29%), paralysis (3.03 and 0%), postoperative myocardial infarction (6.6 and 4.41%) was found to be higher in patients with valve-related disease than in the next screening (4.54% and 14.70%). Patients with preoperative anemia were found to be higher in the valvular group compared to CABG.

Conclusion: Preoperative anemia in patients undergoing surgery for coronary artery disease and valvular heart disease is associated with in-hospital mortality and severe side effects.

Key Words: coronary bypass, myocardial infarction, hemoglobin, cardiopulmonary bypass, blood transfusion.

Corresponding author:

Dr. Hira Shahzad,
Women Medical Officer,
DHQ Narowal

QR code



Please cite this article in press Hira Shahzad et al., **Study to Know Preoperative Anemia Effects and Its Results after Cardiac Surgery**, Indo Am. J. P. Sci, 2018; 05(06).

INTRODUCTION:

Preoperative anemia, coronary artery bypass graft (CABG for short) or valve is an independent predictor of postoperative mortality and hospital morbidity. CABG and valve procedure are often associated with significant blood loss. Patients receive intraoperative blood transfusion (CT), which may increase postoperative mortality, morbidity and risk of infection. Approximately 54.4% of patients undergoing cardiac surgery suffer from anemia. For this reason, surgical complications of preoperative anemia, blood transfusion risk, and coronary bypass parameters are useful for predicting the risk of postoperative and lower survival rates. Countries in South Asia, including Pakistan, share the highest cardiovascular disease burden worldwide and are considered the leading cause of mortality and morbidity. 7.9 million ENT (noncommunicable diseases) total 3,600,000 (45%), death associated with cardiovascular disease. This study was based on current trends in terms of postoperative outcomes associated with preoperative anemia.

MATERIALS AND METHODS:

This was a prospective comparative study based on a 200-patient hospital with cardiopulmonary bypass (CPB) cardiac surgery. According to the World Health Organization (WHO) classification, there were eight patients with preoperative anemia criteria defined as hemoglobin levels <13 g / dl for males and <12 g / dl for females. patients with CABG and valve surgery underwent CABG and valve surgery procedures, such as non-congenital cardiopulmonary bypass anomalies, emergency procedures or emergency repair of patients who were treated in emergency, critical condition pre-operative eg tachycardia or ventricular fibrillation and sudden death were taken before surgery, before room anesthesia preoperative ventilation, preoperative inotropic support, intra-balloon or preoperative acute renal failure (anuria or oliguria <10 ml / h) were not included in the study. Surgical procedures were graded as vaccination, coronary artery bypass graft (CABG), valve (single valve procedure, method, double valve and valve valvular CABG +). Before surgery, the purpose of this study was explained and informed consent was obtained from each patient. All patients routinely received 2000 mg of tranexamic acid after induction of general anesthesia. For procedures with a high risk of bleeding, tranexamic acid infusion was administered until the end of the operation. demographic and clinical characteristics of

the cardiopulmonary.⁴ study parameters during transfusion-triggered hemoglobin levels, post-operative ≥ 8.0 g.DL-1 and remaining <7.0 g.DL-1 by-pass; procedure and perioperative end points were collected. Forward-looking data were analyzed for Ventana using SPSS (Statistical Package for Social Sciences) 20.0. The mean \pm SD was given for the quantitative variables. The frequencies for the qualitative variables are given in percentages. The test was applied to observe the relationship between the anemic and non-anemic groups and the qualitative variables if an independent quality test was applied for the quantitative test (if the cell ratio was less than 5) and the Fisher exact test t. The level of significance was accepted as $\leq 5\%$. All the tests were two queues.

RESULTS:

200 patients were included in the study. 132 patients (66%) and 68 patients (34%) underwent valvular surgery for isolated coronary artery bypass graft surgery; Procedures applied (repair or replacement) were single valve (repair or replacement), 32 (16%), mitral valve (repair or replacement), 22 (11%) procedures. 140 patients (70%) were male and 60 (30%) were female. The mean Hb level was higher in males than females (12.87 ± 1.98 versus 10.63 ± 0.62 mg / dl according to females in Table 1).

Table-1: Descriptive statistics with respect to mean Hemoglobin level

variables		Hemoglobin level (Mean \pm S.D)	P-value
Gender	Male (n=140)	12.87 \pm 1.98	0.001
	Female(n=60)	10.63 \pm 0.62	
Procedure	CABG (n=132)	12.48 \pm 1.98	0.006
	Valvular(n=68)	11.67 \pm 1.88	

The mean age of the patients was 50.63 ± 15.33 . The overall prevalence of anemia was 114 (57%). The prevalence of anemia (51.5% vs 48.5%) and valve cover (45.8 vs 54.2%) were higher in CABG than in males. Mean carpuscular volume in the anemic group was significantly lower; CABG (4.02 ± 0.63 vs 4.45 ± 0.52 , $p = 0.001$) and valve (4.07 ± 0.59 vs 4.67 ± 0.41 , $p = 0.001$) compared with the anemic group. Overall, the mean level of Hb was 12.20 ± 1.98 mg / dL. the mean Hb level was significantly lower in the CABG valve group (11.67 ± 1.88 in general 12.48 ± 1.98 , p value = 0.006) Table-2.

Table-2: Demographical and clinical characteristics of anemic and non anemic patients with respect to procedure type.

		Group		P-value	
		Anemic (n=114)	Non anemic (n=86)		
Gender	Male(n=98)	CABG (n=132)	32(32.7%)	66(67.3%)	0.001
	Female(n=34)		34(100.0%)	0	
	Male(n=42)	Valvular (n=68)	22(52.4%)	20(47.6%)	0.001
	Female(n=26)		26(100%)	0	
Age	CABG(n=132)	60.42±7.19	59±8.21	0.291	
	Valvular(n=68)	33.70±10.97	31.3±7.96	0.378	
Weight (kg)	CABG(n=132)	72.65±17.74	71.51±12.98	0.676	
	Valvular(n=68)	55.12±14.92	54.3±7.14	0.185	
RBC	CABG(n=132)	4.024±0.63	4.412±0.52	0.001	
	Valvular(n=68)	4.07±0.59	4.67±0.41	0.001	
Urea	CABG(n=132)	31.93±9.78	31.98±13.34	0.988	
	Valvular(n=68)	30.62±8.56	26.9±9.25	0.115	
Creatinine	CABG(n=132)	2.8718±.16	0.9818±.61	0.207	
	Valvular(n=68)	2.76±0.161	0.86±0.14	0.058	
CPB time	CABG(n=132)	107.1±30.48	119.2±36.79	0.045	
	Valvular(n=68)	126.0±49.56	128.2±49.3	0.786	
Cross clamp time	CABG(n=132)	59.31±26.52	63.60±25.84	0.342	
	Valvular(n=68)	78.79±34.53	78.0±33.22	0.946	
Blood transfusion	CABG(n=132)	1.67±0.98	1.26±0.60	0.019	
	Valvular(n=68)	1.65±1.07	1.14±1.06	0.048	
Hospital stay	CABG(n=132)	15.0±6.38	7.93±4.7	0.793	
	Valvular(n=68)	17.29±5.7	8.65±5.31	0.149	

Valve (1.65 ± 1.07 vs. 1.14 ± 1.06, p = value, blood transfusion tendency was higher 0.056 in coronary artery bypass with anemia (p = 0.019 value 1.67 ± 0.89 vs 1.26 ± 0.60) (table-2).

Table-3: Association of in hospital outcome with anemic and non anemic patients according to procedure type.

In-hospital outcomes		Anemia (n=114)	Non-Anemic (n=86)	P-value
Wound Infection	CABG(n=132)	4(3.03%)	1(0.75%)	0.048
	Valvular(n=68)	2(2.94%)	0	0.037
Renal Injury	CABG(n=132)	26(19.69%)	15(11.36%)	0.039
	Valvular(n=68)	7(10.29%)	1(1.47%)	0.041
Re-exploration	CABG(n=132)	6(4.54%)	0	0.012
	Valvular(n=68)	10(14.70%)	2(2.94%)	0.036
Post MI	CABG(n=132)	8(6.08%)	2(1.51%)	0.042
	Valvular (n=68)	3(4.41%)	4(5.88%)	0.048
Stroke	CABG (n=132)	4(3.03%)	1(0.76%)	0.056
	Valvular (n=68)	0	0	1.00
AF	CABG (n=132)	14(10.6%)	4(3.03%)	0.011
	Valvular (n=68)	6(8.82%)	1(1.47%)	0.039
Mortality	CABG (n=132)	2(1.5%)	0	0.039
	Valvular(n=68)	2(2.9%)	0	0.046

As anemia, the tendency to reschedule was higher in the CABG valve group (14.70 and 4.54%, p <0.05), as shown in Table 3.

DISCUSSION:

Our results show that the female group of the anemic group is higher than the non-anemic group, indicating that women have a higher preoperative anemia risk. Karkouti found that the woman had 47% of the homemade. In another study by Hung and colleagues, it was found that the females were more common in males than females (32.1% versus 22.8%). This study showed similar results. Carrascal et al. Found no significant difference in preoperative anemia between both genders (53.6 versus 46.3). This contradiction may be due to the bias in the selection of the female patient. Karski and colleagues found that the prevalence of preoperative anemia was 37.3% and that of Carrascal8 and colleagues was 41.9% of the prevalence of preoperative anemia. Hung et al. Reported that prevalence rate of preoperative anemia was 54.4%, and also showed a high preoperative anemia rate in patients undergoing cardiac surgery (57%). While Karkouti and colleagues found preoperative anemia prevalence, this rate was 26% among those with cardiac surgery. This difference may be due to differences in the sample size of the current study. Carrascal 8 and colleagues also showed that the length of stay in the anemic group was longer in the non-anemic group (15.65 ± 14.52 and 3.64 ± 10.61 days), but not significantly different. Miceli et al. He admitted that preoperative anemia was significantly associated with the duration of stay in the long-term hospital for 7 days (54% versus 36.7%). In-hospital mortality and postoperative complications of Carrascal et al. In the anemic group, it was higher in the anemic group (18.9% vs. 9.0%) than in the non-anemic group (46.3% vs. 43.1%). Complications in the anemic group were 18.9% AF, MI and wound infection 4.2%, cardiac output 12.6%, AF 15.9%, MI 1.5% and infection. The wound was 3.7% and the low cardiac output was 9.8%. Baron and colleagues showed that preoperative anemia is associated with a negative outcome. Kulier et al. They observed that preoperative anemia showed a strong correlation with noncardiac complications. For hemoglobin concentrations, a decrease of less than 14 g / dL of 1 g / dL resulted in an increase in adverse events. Bell18 et al. Preoperative hemoglobin <10 g / dL has been shown to be univariate as an independent risk factor for mortality in CABG surgery patients alone. In multivariate analyzes, preoperative hemoglobin is not significant as an independent risk factor for mortality and is only of minor importance for morbidity.

CONCLUSION:

We can conclude that anemic patients have a significantly higher risk of death or severe postoperative complications than do non-anemic patients after cardiac surgery.

REFERENCES:

- Dai, Lu, Stephanie L. Mick, Keith R. McCrae, Penny L. Houghtaling, Joseph F. Sabik III, Eugene H. Blackstone, and Colleen G. Koch. "Preoperative Anemia in Cardiac Operation: Does Hemoglobin Tell the Whole Story?." *The Annals of thoracic surgery* 105, no. 1 (2018): 100-107.
- LaPar, D.J., Hawkins, R.B., McMurry, T.L., Isbell, J.M., Rich, J.B., Speir, A.M., Quader, M.A., Kron, I.L., Kern, J.A., Ailawadi, G. and Investigators for the Virginia Cardiac Services Quality Initiative, 2018. Preoperative anemia versus blood transfusion: Which is the culprit for worse outcomes in cardiac surgery?. *The Journal of thoracic and cardiovascular surgery*.
- Everhart, J.S., Sojka, J.H., Mayerson, J.L., Glassman, A.H. and Scharschmidt, T.J., 2018. Perioperative Allogeneic Red Blood-Cell Transfusion Associated with Surgical Site Infection After Total Hip and Knee Arthroplasty. *JBJS*, 100(4), pp.288-294.
- Abdullah, H.R., Sim, Y.E., Sim, Y.T., Ang, A.L., Chan, Y.H., Richards, T. and Ong, B.C., 2018. Preoperative Red Cell Distribution Width and 30-day mortality in older patients undergoing non-cardiac surgery: a retrospective cohort observational study. *Scientific reports*, 8(1), p.6226.
- Liu, Liu, Lin Liu, Li-Chuang Liang, Zhi-qiang Zhu, Xiao Wan, Heng-bing Dai, and Qiang Huang. "Impact of Preoperative Anemia on Perioperative Outcomes in Patients Undergoing Elective Colorectal Surgery." *Gastroenterology research and practice* 2018 (2018).
- Davis, F.M., Park, Y.J., Grey, S.F., Boniakowski, A.E., Mansour, M.A., Jain, K.M., Nypaver, T., Grossman, M., Gurm, H. and Henke, P.K., 2018. The clinical impact of cardiology consultation prior to major vascular surgery. *Annals of surgery*, 267(1), pp.189-195.
- Brouquet, A., Maggiori, L., Zerbib, P., Lefevre, J.H., Denost, Q., Germain, A., Cotte, E., Beyer-Berjot, L., Munoz-Bongrand, N., Desfourneaux, V. and Rahili, A., 2018. Anti-tnf Therapy Is Associated With an Increased Risk of Postoperative Morbidity After Surgery for Ileocolonic Crohn Disease: Results of a Prospective Nationwide Cohort. *Annals of surgery*, 267(2), pp.221-228.
- Pothof, A.B., Bodewes, T.C., O'Donnell, T.F., Deery, S.E., Shean, K., Soden, P.A., de Borst, G.J. and Schermerhorn, M.L., 2018. Preoperative anemia is associated with mortality after carotid endarterectomy in symptomatic patients. *Journal of vascular surgery*, 67(1), pp.183-190.
- Kindzelski, Bogdan A., Philip Corcoran, Michael P. Siegenthaler, and Keith A. Horvath. "Postoperative acute kidney injury following intraoperative blood product transfusions during cardiac surgery." *Perfusion* 33, no. 1 (2018): 62-70.
- Yong, Priscilla H., Laurence Weinberg, Niloufar Torkamani, Leonid Churilov, Raymond J. Robbins, Ronald Ma, Rinaldo Bellomo et al. "The Presence of Diabetes and Higher HbA1c Are Independently Associated With Adverse Outcomes After Surgery." *Diabetes care* 41, no. 6 (2018): 1172-1179.
- Yong, Priscilla H., Laurence Weinberg, Niloufar Torkamani, Leonid Churilov, Raymond J. Robbins, Ronald Ma, Rinaldo Bellomo et al. "The Presence of Diabetes and Higher HbA1c Are Independently Associated With Adverse Outcomes After Surgery." *Diabetes care* 41, no. 6 (2018): 1172-1179.
- Oprea, Adriana D., J. Mauricio Del Rio, Mary Cooter, Cynthia L. Green, Jörn A. Karhausen, Patrick Nailor, Nicole R. Guinn et al. "Pre-and postoperative anemia, acute kidney injury, and mortality after coronary artery bypass grafting surgery: a retrospective observational study." *Canadian Journal of Anesthesia/Journal canadien d'anesthésie* 65, no. 1 (2018): 46-59.
- Blaudszun, G., Butchart, A. and Klein, A.A., 2018. Blood conservation in cardiac surgery. *Transfusion Medicine*, 28(2), pp.168-180.
- Crawford, T.C., Magruder, J.T., Fraser, C., Suarez-Pierre, A., Alejo, D., Bobbitt, J., Fonner, C.E., Canner, J.K., Horvath, K., Wehberg, K. and Taylor, B., 2018. Less Is More: Results of a Statewide Analysis of the Impact of Blood Transfusion on Coronary Artery Bypass Grafting Outcomes. *The Annals of thoracic surgery*, 105(1), pp.129-136.