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Research Article

**AN ANALYSIS OF THE PATIENTS WITH NEURAL DAMAGE  
DIAGNOSIS FOR FIRST CABG COMPARISON CARRIED OUT  
THROUGH HEART AND LUNG MACHINE: A COMPARATIVE  
RESEARCH SERIES**<sup>1</sup>M. Salman Qamar, <sup>2</sup>M. Irfan Khalid, <sup>3</sup>Muhammad Habib Javed  
<sup>1</sup>Yusra Medical and Dental College Islamabad**Abstract**

**Aim:** To analyze the neural damage in cases with first time CABG comparing the outcomes in therapies using the heart-lung machine and those avoiding the use.

**Method:** We took 12 beginners who were to undergo a CABG at Allied Hospital, Faisalabad from February to September 2017 and randomly subjected them to off-pump and on-pump therapy. We computed the difference in the NIH Stroke Scale results after every 30 days.

**Outcome:** The category of patients with on-pump therapy scored higher on NIHSS than that with off-pump surgery. After thirty days of the operation, the occurrence of Transient Ischemic Attack came out to 15.3 % as reported by on-pump patients and 5 percent reported by the off-pump patients with a P value equal to 0.05. On-pump patients showed a greater occurrence of CVA than the off-pump patients (3.4% & 0% respectively) with a P value of 0.05.

**Conclusion:** A greater number of neural issues follow an on-pump CABG therapy than an off-pump one.

**Keywords:** CABG, neural issues, Transient ischemic attack.

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**INTRODUCTION:**

Colloquially heart bypass with CPB pump has been a standardized method for operational laser revascularization. Recorded reports show that CPB continues to be an origin of brain damage during operations [1]. Neural damage, common after CABG, has 2 kinds. It includes cerebrovascular accident, TIA & makes the patient comatose (occurrence: 3 percent to 6 percent) and the damage is asymptomatic & involves deterioration being neuro-cognitive. The damage related to attentiveness, absorption, STM, small muscles' coordination, and rate of brain and voluntary movement feedback. (occurrence: 20 percent to 80 percent) [2]. CPB results in an acute swelling reaction that produces an intense shielding response, causing light to massive tissue fluid pressurization, and originates a large amount of microemboli in the external corporeal circuit [4] which are the main physiopathological agents causing brain ischemia be they originate from AAO, atria, ventricles or the CPB circuit [3]. The research studies neural issues after 1 month of the surgery.

**METHODOLOGY:**

We took 12 beginners who were to undergo a CABG at Allied Hospital, Faisalabad from February to September 2017 and randomly subjected them to off-pump and on-pump therapy. We computed the difference in the NIH Stroke Scale results after every 30 days which contained 50% patients looking

forward to the off-pump operation and the rest of the 50% to an operation without a heart-lung machine (9/07-3/08). The patients involved: exceeded the age of sixty-five, Had a former record of Cerebrovascular Accident, Transient Ischemic Attack or Unilateral Paresis irrespective of age group, Had LMS stricture (irrespective of age group), Approved to participate in the research, Did not expire in 30 days of surgery, Were not urgent cases. Before surgery, we took the Patient's record (majorly heart disease predisposing factors), neural checkup, computerized tomography examination (neural), carotid angiogram, heart ultrasound and assembled other neural investigations by using The National Institute of Health Stroke Scale. After one month the use of the 15-item NIHSS (Scored on 3-5 rating) revealed further information. Cardiac surgeons helped in determining the nature of operation for each patient. The research was placebo-controlled.

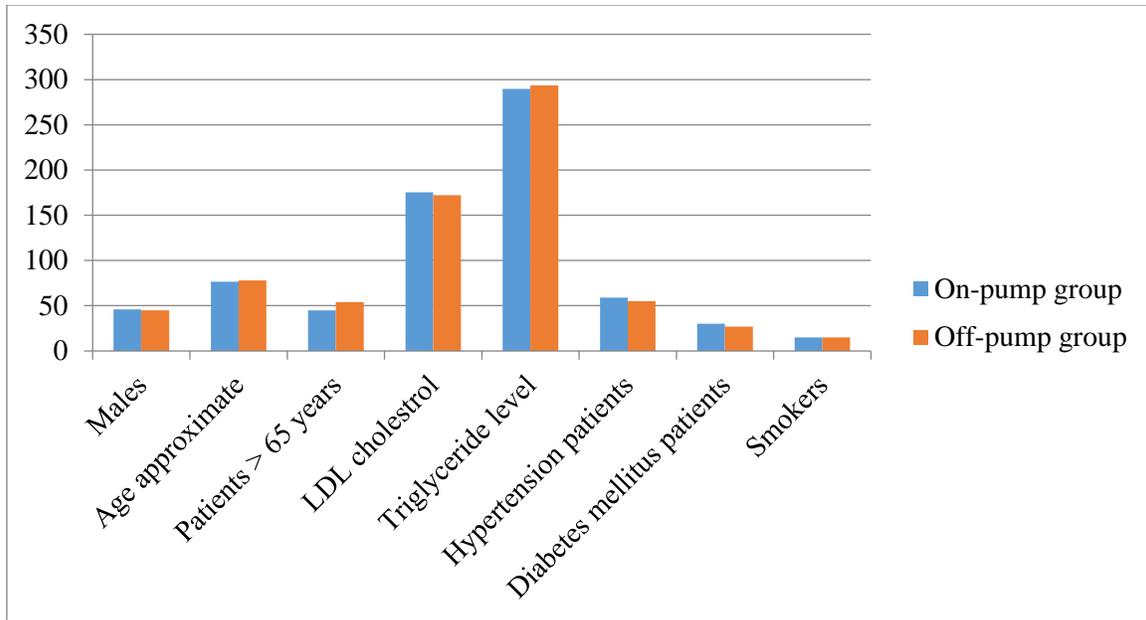
**RESULTS:**

There was a total of 60 people in both categories. Out of them, forty-six were male and fourteen were female belonging to an age range of 59-76 (On-pump group, Category 1) while forty-five were male and fifteen were female in case of Category 2 (off-pump surgery with age range of 64-78). Table-1 shows the demographic, clinical and other objective data for each group that shows no notable difference.

**Table – I:** Baseline features for both categories

	Category 1	Category 2	Probability
Males	46.00	45.00	Not significant
Age approximate	68.0 ± 8.50	71.00 ± 6.90	Not significant
Patients with age above sixty-five	45.00	54.00	Not significant
Low density lipoprotein cholesteric (milligrams per deciliter)	147.20 ± 28.20	144.20 ± 28.00	Not significant
Blood Triacylglycerol count (milligram per deciliter)	239.70 ± 50.0	235.70 ± 57.90	Not significant
High blood pressure cases	59.00	55.00	Not significant
DM cases	30.00	27.00	Not significant
Patients taking cigarettes	15.00	15.00	Not significant

DM: - Diabetes mellitus



The P-value in case of vertigo, loss of eyesight sharpness, altered LOC between categories 1 and 2 came out to be 0.270 that was not notable (with 8 effected from Category 1 and 2 from category 2). The difference between category 1 and 2 was notable when 7 patients were affected by critical neural issues like Acute confusional state, Major depressive

disorder, Stress and sleeplessness, from category 1 and no one from category 2 showed such symptoms. There were 3 cases of optical issues such as blurry visual disorder, tunnel vision and weakened extrinsic eye muscle motions in on-pump category and 1 in case of the off-pump category. The variance was not notable with a probability value of 0.610

**Table – II:** Neural issues

	No. of patients (category 1)	No. of patients (Category 2)	Probability
Psychosomatic issues	7.00	00	0.0010
Transient ischemic attack	9.00 (15.3%)	3.00 (5%)	0.050
Stroke	2.00 (3.4%)	00	0.050

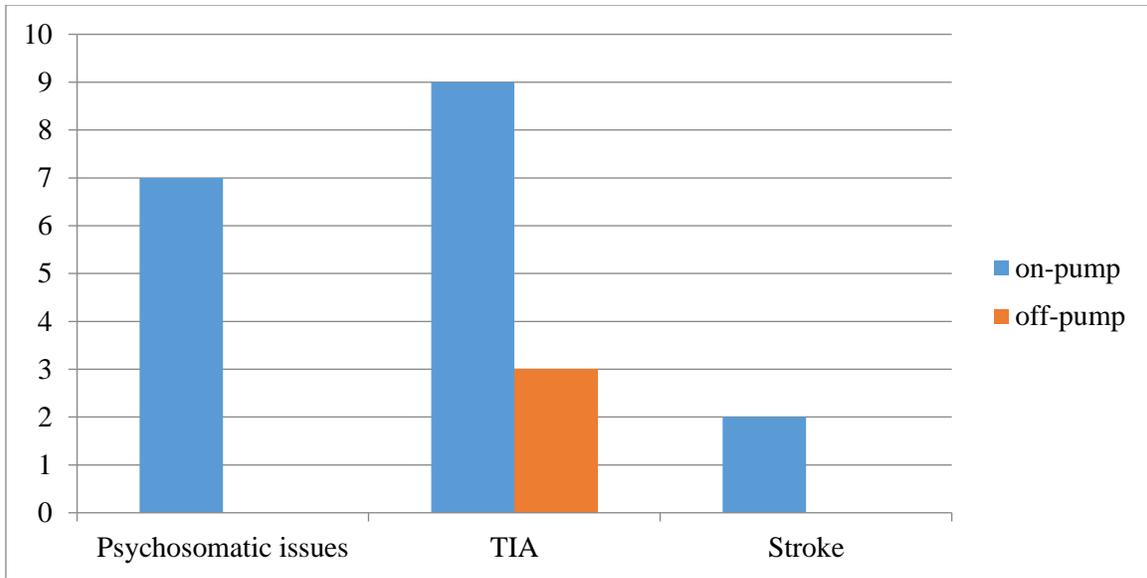
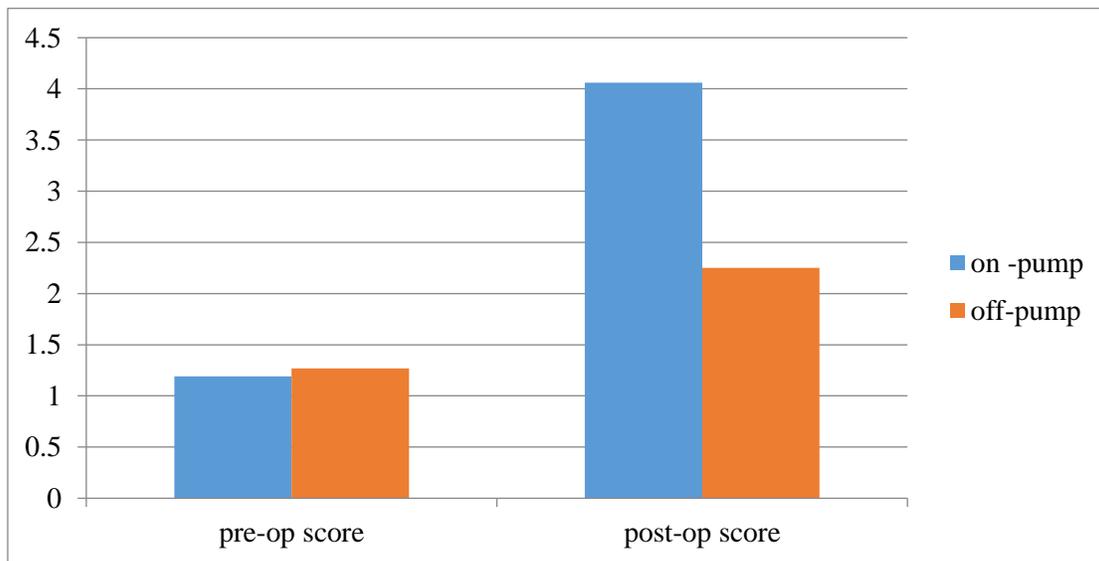


Table-3 shows pre and post National Institute of Health Stroke Scale scores. Thus the category 1 was more prone to have post-surgery neural issues as compared to category 2

**Table – III:** Contrast between on-pump and off-pump patients’ scores

	Category 1	Category 2	Probability
Scores on NIHSS before surgery	0.230±0.960	0.280±0.990	Not significant
Scores after thirty days	1.280±2.780	0.500±1.750	0.0010



**DISCUSSION:**

The greatest occurring neural issues after surgery include critical morbidity [5]. After eight weeks of the heart-based operation variations in neural functioning may continue to an extent of 25-30% with hardly any lesser incidence after a year [4]. A

panel study of neural functioning in people after CABG therapy revealed neural downturn chances in forty-two percent after 5 years of the operation [5]. Significant neural incidents, like impairing strokes, appear to be the most threatening issues with an occurrence ratio of 0.8% to 5.2% in people going

through heart surgeries and caused by embolization by atheromatous debris during surgical operation of the mutilated aorta. While, loss of cognition, resultant from micro-embolization of gaseous and particulate matter comes out to be more frequently occurring and harder to judge as compared to stroke [5]. Fresh comparative studies of the neural functioning in patients of off-pump and on-pump surgery show contrasting outcomes.

A research carried out on two hundred and eighty-one cases showed no contrast in neural results at three and twelve months [6], while another study carried out on two hundred and nineteen people reported a rapid neural degeneration within 4 days of the operation anticipating further notable results after 3 months of having a CABG therapy [7]. On the other hand, 2 types of research, carried out on lesser cases, revealed quite healthier neural functioning in off-pump patients [8, 9]. A Coronary Artery Bypass Grafting surgery without cardiopulmonary bypass tend to ameliorate results in vulnerable cases [10-12] while an on pump surgery is often linked to neural disabilities [5]. A modern multicomponent research on sixteen thousand one hundred and eighty-four people revealed that a coronary artery bypass using cardiopulmonary pump proved to be secure if neural risk causing tendencies are brought into account [13]. The occurrence of considerable surgical neural consequences in patients undergoing primary isolated coronary bypass in the current research was lesser than two percent that is similar to the occurrence revealed in current literature [14 – 16]. The National Institute of Health Stroke Scale scores reveals that an off-pump CABG reduces the risk for Neuropsychological degeneration.

### CONCLUSION:

Researchers have done a lot of work in the field of CABG and analyzed the probable pros and cons of employing an on-pump and an off-pump technique. Today the off-pump surgery type is catching much attention. Researchers have frequently stressed upon the merits of carrying out a CABG without the use of cardiopulmonary bypass. But still, we see much difference of opinion when it comes to the consequences (both short term and long term) of an on-pump and off-pump coronary artery bypass graft. A great amount of evidence from randomized controlled trials is there that indicates that a coronary artery bypass without the heart-lung machine leads to a lower risk of morbidity, an equal level of implant compatibility, and is significantly less expensive in contrast to an on-pump bypass surgery. The current research reveals that after one month of the surgery the category of patients who went through an off-pump surgery lived a life far healthier than those who

went through an on-pump graft therapy. Neurocognitive sequelae are the most significant and the most frequently occurring issues resultant from coronary artery bypass grafting. The probability of such issues will decrease if the grafting completes without the use of the heart-lung machine. These are just the initial reports that show positive consequences. The research opens the way for further researches so that the use of this technique becomes common. Though the results of the current study emphasize the use of off-pump CABG technique rather than on-pump surgery it needs a lot of further verification to further support it.

### REFERENCES:

1. Zangrillo A, Crescenzi G, Landoni G, Leoni A, Marino G, Calabrò MG, et al. Off-pump coronary artery bypass grafting reduces postoperative neurologic complications. *J Cardiothorac Vasc Anesth* 2005;19(2):193-6.
2. Biancari F, Mosorin M, Rasinaho E, Lahtinen J, Heikkinen J, Niemelä E, et al. Postoperative stroke after off-pump versus on-pump coronary artery bypass surgery. *J Thorac Cardiovasc Surg* 2007;133(1):169-73.
3. Biancari F, Mosorin M, Rasinaho E, Lahtinen J, Heikkinen J, Niemelä E, et al. Postoperative stroke after off-pump versus on-pump coronary artery bypass surgery. *J Thorac Cardiovasc Surg* 2007;133(1):169-73.
4. Schmitz C, Weinreich S, Schneider R, Schneider D, Speth I, Schulze-Rauschenbach C, et al. Off-Pump versus on-pump coronary artery bypass: can OPCAB reduce neurologic injury? *Heart Surg Forum*; 2003;6(3):127-30.
5. Zamvar V, Williams D, Hall J, Payne N, Cann C, Young K, et al. Assessment of neurocognitive impairment after off-pump and on-pump techniques for coronary artery bypass graft surgery: a prospective randomized controlled trial. *BMJ* 2002;325(7375):1268.
6. Raja SG. Pump or no pump for coronary artery bypass: current best available evidence. *Tex Heart Inst J* 2005;32(4):489-501.
7. Scarborough JE, White W, Derilus FE, Mathew JP, Newman MF, Landolfo KP. Neurologic outcomes after coronary artery bypass grafting with and without cardiopulmonary bypass. *Semin Thorac Cardiovasc Surg* 2003;15(1):52-62.
8. Al-Ruzzeq S, George S, Bustami M, Wray J, Ilesley C, Athanasiou T, et al. Effect of off-pump coronary artery bypass surgery on clinical, angiographic, neurocognitive, and quality of life outcomes: randomized controlled trial *BMJ* June 2006; doi:10.1136/bmj.38852.479907.7C.

9. Van Dijk D, Jansen E, Hijman R, Nierich A, Diephuis J, Moons K, et al. Cognitive outcome after off-pump and on-pump coronary artery bypass graft surgery: a randomized trial. *JAMA* 2002; 287:1405-12.
7. Van Dijk D, Moons K, Keizer A, Jansen E, Hijman R, Diephuis J, et al. Association between early and three-month cognitive outcome after off-pump and on-pump coronary bypass surgery. *Heart* 2004; 90:431-4.
10. Zamvar V, Williams D, Hall J, Payne N, Cann C, Young K, et al. Assessment of neurocognitive impairment after off-pump and on-pump techniques for coronary artery bypass graft surgery: a prospective randomized controlled trial. *BMJ* 2002; 325:1268-71.
11. Diegeler A, Hirsch R, Schneider F, Schilling L, Falk V, Rauch T, et al. Neurocognitive outcome in off-pump versus conventional coronary bypass operation. *Ann Thorac Surg* 2000; 69:1162-6.
12. Al-Ruzzeh S, Nakamura K, Athanasiou T. Does off-pump coronary artery bypass (OPCAB) surgery improve the outcome in high-risk patients? A comparative study of 1398 high-risk patients. *Eur J Cardiothorac Surg* 2003; 23:50-5.
13. Cleveland JC Jr, Shroyer AL, Chen AY. Off-pump coronary artery bypass grafting decreases risk-adjusted mortality, and morbidity. *Ann Thorac Surg* 2001; 72:1282-8.
14. Bowles BJ, Lee JD, Dang CR. Coronary artery bypass performed without the use of cardiopulmonary bypass is associated with reduced cerebral microemboli and improved clinical results. *Chest* 2001; 119:25-30.
15. Bureaus J, Gummert JF, Borger MA. Stroke after cardiac surgery: a risk factor analysis of 16184 consecutive adult patients. *Ann Thorac Surg* 2003; 75:472-8.
16. Motallebzadeh R, Bland JM, Markus HS, Kaski JC, Jahangiri M. Neurocognitive function and cerebral emboli: Randomized study of on-pump versus off-pump coronary artery bypass surgery. *Ann Thorac Surg* 2007; 83(2):475-82.