International Journal Dental and Medical Sciences Research
Volume 3, Issue 3, May - June 2021 pp 440-445 www.ijdmsrjournal.com ISSN: 2582-6018

Study to Evaluate Post Operative Drop in Serum Albumin as a Marker for Surgical Stress and Predictor for Clinical Outcome in Laparatomy Patients

Dr.M.Vinoth Kumar MS.,DA

Submitted: 05-06-2021 Revised: 18-06-2021 Accepted: 20-06-2021

ABSTRACT :
Surgical interventions trigger a metabolic stress response of varying magnitude which contributes to complications, delayed recovery and prolonged hospital stay.The ideal marker has to be easy to measure, available early in the preoperative course, and economical. It should be robustly correlated with the extent of surgical trauma and be a reliable predictor of complications and prolonged hospital stay. Albumin, the most abundant protein in humans, is widely used as a nutritional marker and an outcome predictor. Albumin also shows an instantaneous response to surgical tension and could, therefore, meet the criteria to determine surgical stress and to predict a complicated postoperative course. The present study aims to assess serum albumin levels as response marker for surgical stress and as a predictor of adverse outcomes.

KEYWORDS : Albumin, Surgical stress.

I. INTRODUCTION :

Aims and Objectives

a) To assess serum albumin levels as a marker for surgical stress

b) To assess serum albumin levels as a potential predictor of adverse outcomes like delayed wound healing, increased hospital stay and organ dysfunction.

Materials and Methods

Place of study:Department of General Surgery, Stanley medical college and hospital

Duration:

November 2016 to July 2017

Study design:

Prospective observational study

Selection of cases

From cases undergoing laparotomy both electively and in emergency

Sample size

50 cases

• **Inclusion criteria:**

•age group 16-70 years

•laparatomies both elective and emergencies

• **Exclusion criteria:**

• Age < 16 years or > 70 years.

• HIV patients with CD count < 200

• Patients with known decompensated liver disease

Study group

• Preoperative and postoperative albumin levels were measured for the patients and correlation between the post-op fall in albumin level was compared with the incidence of post-op complications as determined by Dindo-Clavien scoring.

Methodology

q Study included patients who underwent laparotomies from November 2016 to July 2017

q Serum albumin (g/L) levels were measured in preoperative period in a homogeneous manner as per the hospital technical guidelines. Samples on Post Operative Day 0 were taken 4–6 hours postoperatively. Subsequently, daily albumin level was monitored up to POD - 5

Complications after surgery were graded by severity by the apply of the validated Dindo-Clavien system; grades I-II were measured as minor and III-IV were measured as major complications, respectively. Mortality was documented as grade V. Hospital stay was counted from the day of surgery

Statistical Analysis

Pre and Post operative albumin levels and its statistical significance in predicting outcome was evaluated using SPSS software analysis of repeated measures ANOVA.

International Journal Dental and Medical Sciences Research
Volume 3, Issue 3, May - June 2021 pp 440-445 www.ijdmsrjournal.com ISSN: 2582-6018

DINDO-CLAVIEN System of grading

Grade I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, and radiological interventions. Allowed therapeutic regimens are as follows: drugs as antiemetics, antipyretics, analgetics, diuretics, electrolytes, and physiotherapy. This grade also includes wound infections opened at the bedside.
Grade II	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included.
Grade III	Requiring surgical, endoscopic, or radiological intervention
Grade IIIa	Intervention not under general anesthesia
Grade IIIb	Intervention under general anesthesia
Grade IV	Life-threatening complication requiring IC/ICU management
Grade IVa	Single organ dysfunction (including dialysis)
Grade IVb	Multiorgan dysfunction
Grade V	Death of a patient

II. RESULTS:

Age distribution of the sample :

[redacted]

Gender distribution of the sample :
Majority of them were males (60%, n=30).

Surgery Performed :
The following table depicts the type of surgery done for the patients.

Surgery Performed	Frequency	Percent
(Rt) hemiorapphyomentectomy done	1	2.0
Adhesiolysis	1	2.0
Diversion colostomy	1	2.0
Double barrel colostomy	1	2.0
Graham's omental patch closure	11	22.0
Jejunostomy with resection of 100cm gangrene bowel	1	2.0
Jejunostomy with resection of gangrene bowel up to terminal ileum	1	2.0
Laporotomy(L) salpingectomy	1	2.0
Laporotomy(Lt) oopherectomy	1	2.0
Laporotomy(R) oophorectomy done	1	2.0
Laporotomy(R) salpingectomy	3	6.0
Laporotomy (Rt) oophorectomy	2	4.0
Laporotomyadhesiolysis	3	6.0
Laparotomy and proceed	1	2.0
Laporotomyappendicectomy	1	2.0
Laporotomyappendicectomy done	1	2.0
Laporotomyomentectomy	2	4.0
Laporotomy packing done	1	2.0
Laporotomyresection anastomosis	2	4.0
Laporotomywash given DT kept	2	4.0
Laporotomywound wash	1	2.0
Limited resection with ileostomy	1	2.0
Polytraumatransverse colon laceration resection anastomosis	1	2.0
Primary suturing in transverse colon done	1	2.0
Resection anastamosis	1	2.0
Resection anastamosis	1	2.0
Resection anastamosis done	1	2.0
Resection anastomosis of jejunum done	1	2.0
Resection anastomosis	1	2.0
Resection and primary anastamosis	1	2.0
Segmentelilleal resection done	1	2.0
Subtotal gastrectomy with D2 clearance	1	2.0

Table 2: Surgery performed

International Journal Dental and Medical Sciences Research
Volume 3, Issue 3, May - June 2021 pp 440-445 www.ijdmsrjournal.com ISSN: 2582-6018

Dindo-Clavien Scoring
The following table illustrates the Dindo-Clavien Scoring of the patients

Dindo-Clavien Scoring	Frequency	Percent
Grade I	19	38.0
Grade II	17	34.0
Grade III	3	6.0
Grade IIIa	6	12.0
Grade IV	1	2.0
Grade IV b	2	4.0
Grade IVa	1	2.0
Grade V	1	2.0
Total	50	100.0

Table 3: Dindo-Clavien Scoring

Complications present:
The following table demonstrates the complications present in the patients.

International Journal Dental and Medical Sciences Research
Volume 3, Issue 3, May - June 2021 pp 440-445 www.ijdmsrjournal.com ISSN: 2582-6018

Complications if any	Frequency	Percent
AKI dialysis done	1	2.0
AKI underwent dialysis	1	2.0
AKI wound gapping	1	2.0
AKI wound infection	1	2.0
Blood transfusion done	6	12.0
Burst abdomen secondary suturing done	1	2.0
Elevated renal parameters, wound infection	2	4.0
Mild fever	1	2.0
MODS	3	6.0
MODS (ventilator support)	1	2.0
NIL	17	34.0
Post op fever	4	8.0
Wound gapping secondary suturing done	8	16.0
Wound infection	3	6.0

Table 4: Complications present

Duration of stay in the hospital

The duration of the stay is depicted in the following figure with a mean of 8.32 days (S.D=4.468) for 47 patients while two of them died on 10th post operativeday and one of them on 12th post operative day.

International Journal Dental and Medical Sciences Research
Volume 3, Issue 3, May - June 2021 pp 440-445 www.ijdmsrjournal.com ISSN: 2582-6018

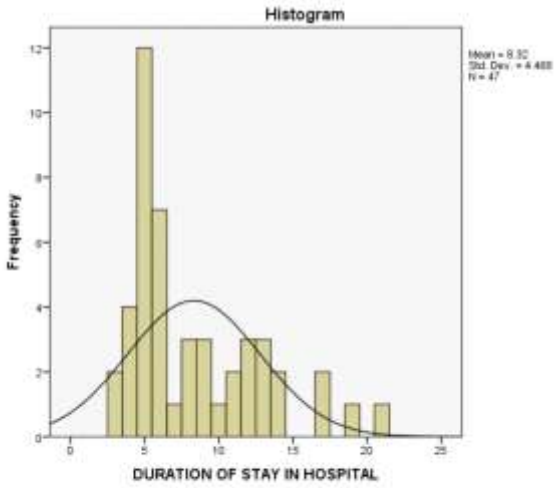


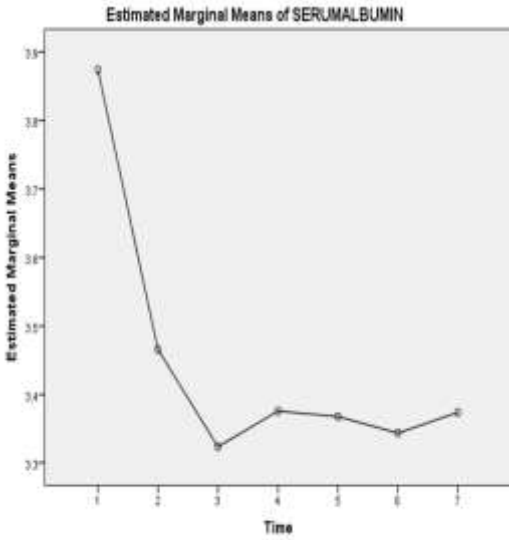
Figure 3:Duration of stay in hospital

Descriptive Statistics of the measures
The following table shows the descriptive statistics of the measures

Time	Mean	Std. Deviation
PREOP ALBUMIN	3.874	.4615
POD 0	3.466	.5255
POD 1	3.324	.6029
POD 2	3.376	.6063
POD 3	3.368	.6242
POD 4	3.344	.6566
POD 5	3.374	.6417

Table 6: Descriptive statistics

.
A repetitive measures ANOVA with a Greenhouse-Geisser correction determined that mean serum albumin differed statistically significantly between time points



(1=Pre operative, 2-7= Post operative days 0 to 5)

Figure 4: repeated measures ANOVA

III. CONCLUSION

Using the serum albumin as a marker, reliable predictions can be made regarding the surgical complications, duration of stay in the hospital, the severity of surgical stress,

REFERENCES

[1]. M. Buunen, M. Gholghesaei, R. Veldkamp, D. W. Meijer, H. J. Bonjer, and N. D. Bouvy, "Stress response to laparoscopic surgery: a review," Surgical Endoscopy and Other Interventional Techniques, vol. 18, no. 7, pp. 1022–1028, 2004.

[2]. J. P. Desborough, "The stress response to trauma and surgery," British Journal of Anaesthesia, vol. 85, no. 1, pp. 109–117, 2000.

[3]. Y. Haga, T. Beppu, K. Doi et al., "Systemic inflammatory response syndrome and organ dysfunction following gastrointestinal surgery," Critical Care Medicine, vol. 25, no. 12, pp. 1994–2000, 1997.

[4]. R. Hall, "Identification of inflammatory mediators and their modulation by strategies for the management of the systemic inflammatory response during cardiac surgery," Journal of Cardiothoracic and Vascular Anesthesia, vol. 27, no. 5, pp. 983–1033, 2013.

[5]. S. Karanika, T. Karantanos, and G. E. Theodoropoulos, "Immune response after laparoscopic colectomy for cancer: a review," Gastroenterology Report, vol. 1, no. 2, pp. 85–94, 2013.

[6]. E. Lin, S. E. Calvano, and S. F. Lowry, "Inflammatory cytokines and cell response in surgery," Surgery, vol. 127, no. 2, pp. 117–126, 2000.

[7]. P. E. Marik and M. Flemmer, "The immune response to surgery andtrauma: implications for treatment," Journal of Trauma and Acute Care Surgery, vol. 73, no. 4, pp. 801–808, 2012.

[8]. M. M. E. Coolsen, R. M. van Dam, A. A. van der Wilt, K. Slim, K. Lassen, and C. H. C. Dejong, "Systematic review and meta-analysis of enhanced recovery after pancreatic surgery with particular emphasis on pancreaticoduodenectomies," World Journal of Surgery, vol. 37, no. 8, pp. 1909–1918, 2013.

[9]. M. Greco, G. Capretti, L. Beretta, M. Gemma, N. Pecorelli, and M. Braga, "Enhanced recovery program in colorectal surgery: a metaanalysis of randomized controlled trials," World Journal of Surgery, vol. 38, no. 6, pp. 1531–1541, 2014.

[10]. S. Muller, M. P. Zalunardo, M. Hubner, P. A. Clavien, and N. Demartines, "A fast-track program reduces complications and length of hospital stay after open colonic surgery," Gastroenterology, vol. 136, no. 3, pp. 842–847, 2009.

[11]. Thorell, J. Nygren, and O. Ljungqvist, "Insulin resistance: a marker of surgical stress," Current Opinion in Clinical Nutrition and Metabolic Care, vol. 2, no. 1, pp. 69–78, 1999.

[12]. Fleck, G. Raines, F. Hawker et al., "Increased vascular permeability: a major cause of hypoalbuminaemia in disease and injury," The Lancet, vol. 325, no. 8432, pp. 781–784, 1985.

[13]. M. Ryan, A. Hearty, R. S. Prichard, A. Cunningham, S. P. Rowley, and J. V. Reynolds, "Association of hypoalbuminemia on the firstpostoperative day and complications following esophagectomy," Journal of Gastrointestinal Surgery, vol. 11, no. 10, pp. 1355–1360, 2007.

[14]. H. J. Smeets, J. Kievit, F. T. Dulfer, J. Hermans, and A. J. Moolenaar, "Analysis of post-operative hypalbuminaemia: a clinical study," International Surgery, vol. 79, no. 2, pp. 152–157, 1994.

[15]. Martin Hübner, Styliani Mantziari, Nicolas Demartines, François Pralong, Pauline Coti-Bertrand, and Markus Schäfer, "Postoperative Albumin Drop Is a Marker for Surgical Stress and a Predictor for Clinical Outcome: A Pilot Study," Gastroenterology Research and Practice, vol. 2016, Article ID 8743187, 8 pages,