



OBSERVATION OF PRE AND POSTOPERATIVE HEMOGLOBIN AND HEMATOCRIT LEVELS IN ELECTIVE SURGERIES

Surgery

Dr. Binod Kumar Associate professor, Department Of Surgery, PMCH Patna.

Dr. Chandrahas Yadav* Junior Resident, Department Of Surgery, PMCH Patna. *Corresponding Author

Dr. Prince Raj Junior Resident, Department Of Surgery, PMCH Patna.

ABSTRACT

Purpose: To assess the change in hemoglobin and hematocrit postoperatively

Methods: fifty patients were included. Laboratory tests including complete blood count and white blood cells were performed prior to surgery and postoperatively on day 1 and day 5. Surgical time, volume of saline perfusion and amount of blood loss were also recorded.

Results: Mean preoperative hematocrit was 42.01% (4.63 SD), whereas mean postoperative hematocrit at 24 h decreased to 36.78% (SD 5.11) ($p < 0.021$). Mean preoperative hemoglobin was 14.23 g/dL (1.73 SD), and mean postoperative hemoglobin at 24 h decreased to 12.40 g/dL (SD 1.92) ($p = 0.03$). Platelets and white blood cells, as well as the remaining biochemical parameters showed no significant difference between preoperative and postoperative samples. Lost blood volume worked out with the logarithmic method for estimated blood loss was which 0.78 liters (SD 0.45). Lost blood volume taking into account, the red blood cell mass was also 0.78 liters (SD 0.45).

Conclusion: A significant decrease in hemoglobin and hematocrit after surgeries were observed. Although patients did not show clinical signs of anemia or bleeding, blood loss should be considered when planning a surgery, especially in patients at risk of anemia. According to our results, we recommend a postoperative control analysis postoperatively.

KEYWORDS

INTRODUCTION:

Preoperative blood examination and other necessary investigations are practised very commonly. It is also a common practice for surgeons to check post operative hemoglobin level following surgeries. Several studies have reported physician overuse of various lab tests, mostly preoperatively, and all concluded that such testing has no clinical use and should therefore be individualised(1-3). The purpose of this retrospective chart review is to examine whether routine hemoglobin level testing following elective surgeries has any clinical use in guiding postoperative care.

MATERIALS AND METHODS:

We identified patients who underwent elective surgeries at patna medical college and hospital, a large tertiary care academic hospital, between June 2019 and June 2020. We decided to limit our patients to those who came for elective procedures and one surgery at a time. Patients were also excluded if they had a history of coagulopathy, were on blood thinners, received a preoperative blood transfusion, or lacked a preoperative hemoglobin level drawn within a month from the surgery date, or the patients who needed intraoperative blood transfusions. The following data was collected on all patients that met our inclusion criteria: (1) demographics, past medical, and surgical histories; (2) surgery indications; (3) estimated blood loss, intravenous fluid volume (IVFV); (4) laboratory results including preoperative and postoperative hemoglobin levels, timing of postoperative hemoglobin testing relative to surgery endtime; and (5) postoperative course including symptoms or signs suggesting anemia such as dizziness, tachycardia (pulse 100 beats per minute), hypotension (blood pressure $< 90/60$ mm Hg), and low urine output < 30 ml/hr) repeat postoperative hemoglobin testing.

RESULTS:

Fifty were included in the present study, undergoing surgery between June 2019 and June 2020. All patients followed controls, elective surgeries were done.

The mean preoperative hematocrit was 46.7% (3.04 SD), whereas postoperative hematocrit was 40.24% (SD 2.6), being this difference statistically significant ($p < 0.05$.)

Regarding the preoperative hemoglobin, mean value was 12.264 g/dL (1.22 SD), which decreased to 9.58 g/dL (0.86SD) postoperative, once more being this difference statistically significant ($p < 0.05$).

On the other hand, both the platelets and leukocytes levels showed no significant difference between preoperative and postoperative samples (233,636.36 platelets/ μ L (42,954.09 SD) vs 209,000 platelets/ μ L

(32,695.56 SD), $p > 0.05$ & 6427.27 leukocytes/ μ L (SD 1461.56) vs 6881.81 leukocytes/ μ L (1362.21 SD) $p > 0,05$). The values of creatinine and urea do not show significant differences at the same timings.

Parameters studied for the present study, preoperative (pre) and postsurgery (post). Hematocrit and hemoglobin values were the only parameters to show statistically significant differences between the preoperative and postoperative results. The remaining measurements were non-significant. SD: standard deviation.

		Mean	sd	P value
HEMOGLOBIN	PREOPERATIVE	12.264 g/Dl	1.22	
	POSTOPERATIVE	9.58 g/dL	0.86	<0.05
HEMATOCRIT	PREOPERATIVE	46.7%	3.04	
	POSTOPERATIVE	40.24%	2.6	<0.05
PLATELET	PREOPERATIVE	233,636.36 platelets/ μ L		
	POSTOPERATIVE	209,000 platelets/ μ L		>0.05
LEUCOCYTE	PREOPERATIVE	6427.27 leukocytes/ μ L		
	POSTOPERATIVE	6881.81 leukocytes/ μ L		>0.05
CREATININE	PREOPERATIVE	0.93mg/dl		
	POSTOPERATIVE	1.2mg/dl		>0.05
UREA	PREOPERATIVE	30.82mg/dl		
	POSTOPERATIVE	27.82		>0.05

No active bleeding or anesthetic anomalies occurred during any surgery. Neither was any active bleeding observed during postoperative hospitalization. No patient presented clinical symptoms of anemia (tachycardia, hypertension, pallor). Patients started walking with the aid of crutches at 2nd day after surgery with well-tolerated pain using analgesics and anti-inflammatory and were discharged from hospital when need to.

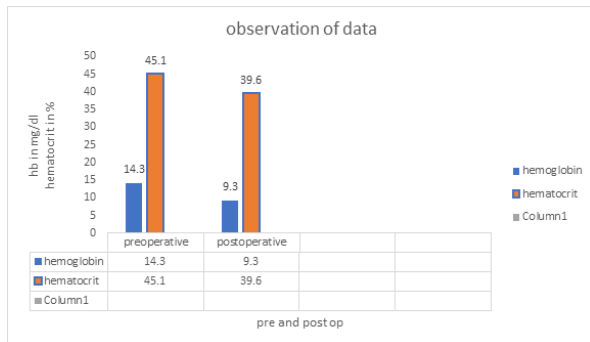
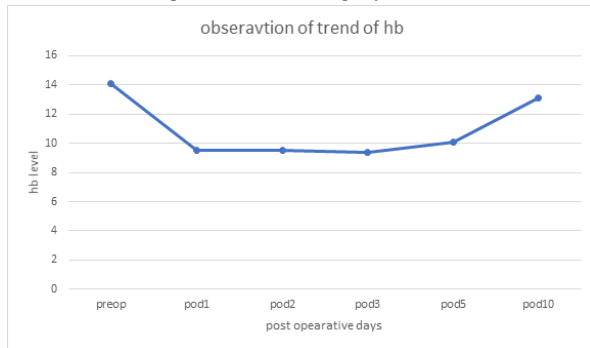
No patient received a blood transfusion in the present study, either during or after surgery.

DISCUSSION:

The main aim of this study is that to observe the changes in hemoglobin and hematocrit postoperatively as compared previously to surgeries.

In most patients preoperatively the hemoglobin level are within the normal range for that sex, age and gender and are fit for surgery. But after surgery there are seen decrease in both hemoglobin and

hematocrit postoperatively especially on day1 to day 3 then there is increase in both the parameters following day 5.



In a study , a decrease in both hemoglobin levels and hematocrit was found, with almost two points in the case of hemoglobin and seven points in hematocrit. In contrast, in the same measurements, no statistically significant decreases were noted in platelet or leukocyte levels, or within the biochemical parameters measured, therefore dismissing any chance of blood dilution possibility. Furthermore, taking into account the 0.78 liters blood loss, we could think that a perioperative and postoperative bleeding is present.(4).

In conclusion, routine hemoglobin testing does not dictate postoperative patient care following total laparoscopic hysterectomy. It should be reserved for patients experiencing signs or symptoms of hemodynamic compromise. By eliminating routine hemoglobin testing after total laparoscopic hysterectomy, health care cost savings could be substantial.(5)

CONCLUSION:

In our study we observe that there is temporary decrease in hemogloin and hematocrit post surgery in uncomplicated elective surgeries.

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