



## A PROSPECTIVE STUDY ON SIGNIFICANCE OF CRP VALUES IN ABDOMINAL SURGERY

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**ABSTRACT** CRP level rises during inflammatory process and it is the early and sensitive response to bacterial, viral and fungal infections, neoplastic disease, myocardial infarction & surgical trauma. CRP concentration may rise in response to acute phase stimulus in 6 hours reaching peak value around 48 hours.

Aims of this study was To find out a correlation between postoperative infective complication with CRP, total leukocyte count (TLC) and temperature.

This is a prospective observational study carried out in Geetanjali hospital for one year from 1<sup>st</sup> may 2015 to 30<sup>th</sup> April 2014. During this period we have included all the patients (67 patients) who have undergone major abdominal surgery for cancer and have given consent for the study. Procedure did for palliation have not been included.

Out of 67 patients, 24 patients were diagnosed with PICs. Among these 24 patients, 19 patients were having dramatic rise of CRP, 24 patients were having high TLC on same day (17) or on second day (7) and 17 patients were having rise in temperature on same day and 2 patients on second day.

Although clinical suspicion of PIC is the best single modality for diagnosis but combination of CRP with clinical suspicion (history, examination and temperature) helps in identifying PIC earliest. Moreover rise in TLC in previous category make the diagnosis stronger.

**KEYWORDS :** C - reactive protein, postoperative infective complications, abdominal cancer surgery.

### INTRODUCTION:

In 1930, Tillet et al discovered first acute phase protein, C Reactive Protein (CRP) in pneumonia patients<sup>1</sup>. CRP level rises during inflammatory process<sup>2</sup> and it is the early and sensitive response to bacterial, viral and fungal infections, neoplastic disease, myocardial infarction & surgical trauma<sup>3</sup>. CRP concentration may rise in response to acute phase stimulus in 6 hours reaching peak value around 48 hours<sup>4</sup>.

Postoperative infectious complication (PIC) is an important aspect in defining a quality of time patient stayed in any hospital and influence patient outcomes (morbidity and mortality) and hospital cost. Beside, CRP is a cheap & widely available<sup>5</sup> it is the earliest to rise during any infectious complication. CRP levels rise during postoperative period because of surgical trauma but tends to normalize rapidly because of its short half life of 19 hours<sup>4</sup>.

**AIMS:** Aims of this study was To find out a correlation between

postoperative infective complication with CRP, total leukocyte count (TLC) and temperature

### MATERIALS & METHODS:

This is a prospective observational study carried out in Geetanjali hospital for one year from 1<sup>st</sup> may 2015 to 30<sup>th</sup> April 2014. During this period we have included all the patients (67 patients) who have undergone major abdominal surgery for cancer and have given consent for the study. Procedure did for palliation have not been included.

### DATA COLLECTION:

All the patients who were included in the study were advised CRP & TLC on postoperative day (POD) 2<sup>nd</sup>, 3<sup>rd</sup> and 5<sup>th</sup> considering the day after surgery as POD 1<sup>st</sup>. Every patient was checked for rise in temperature 4hrly.

### RESULTS:

**Table 1**

Number of patients	CRP					Temperature				TLC				PIC
	Dramatic rise	Mean value			Rise of temperature	Mean value			Rise in TLC	Mean value				
		POD2	POD3	POD5		POD2	POD3	POD5		POD2	POD3	POD5		
19	Y	184	166	146	17 Y on same day	102	100.6	99	13 on same day	15800	14900	13600	Y	
					2 on next day	99	100.4	99.6	6 on next day	16000	15300	12400		
5	N	138	121	94	Y	101	100	98.4	4 on same day	14300	14100	11300	Y	
									1 on next day	14600	11400	10800		
6	N	142	103	95	N	99	98.8	98.6	Y	14200	13500	10600	N	
23	N	139	94	91	N	98.4	98	98.4	N	9400	8900	9000	N	
9	Y	161	137	119	N	99.2	98.4	98.8	N	8700	8800	9300	N	
5	N	131	129	115	Y	100	99.6	99	N	11200	10700	10900	N	
Total - 67	28	NA			29	NA			30	NA			24	

### DISCUSSION:

Now a day, especially in India, when there is scarcity of bed available for patients in hospitals, everyone wants to discharge the patient as early as possible mostly within 5 PODs, which also reduces his cost. A

cheap and widely available marker like CRP can help in identifying such patients and ensures safety of patient to some extent. Moreover, on POD 3 negative predictive value (NPV) of CRP is more than 90% making it a reliable marker<sup>7</sup>. A meta-analysis has also found a high

NPV in detecting anastomotic leak in colorectal surgery<sup>6</sup>. Some studies have suggested that after an initial rise in CRP values after surgery its values tends to normalize around POD3 in absence of any infectious complications<sup>7-12</sup>.

Various studies have been done on CRP and in most studies; CRP levels were significantly higher in patients with infectious complications than in without infectious complications patients. And this difference increases with each POD<sup>5</sup>.

In this study, we have tried to find out the role of CRP in detecting PIC in major abdominal surgeries in cancer. Out of 67 patients, we have 19 patients who got rise in temperature. On analysis we found that all of 19 patients were having dramatic rise in CRP values although a cut off value of CRP couldn't be decided because of variation in CRP values in patients with PIC and without PIC. But in patients without PIC there was no dramatic rise in CRP. Suggesting that dramatic rise in CRP indicates PIC. In such patients we stepped up antibiotics, identified the source of infection and treated accordingly. Out of these 19 patients 13 patients were having rise of TLC on day of suspicion and remaining 6 patients developed high TLC in following days. Suggesting that although TLC can guide us in diagnosing PIC but CRP and temperature are earliest.

In second group (5 patients), where we didn't find a dramatic rise in CRP but temperature was raised we tried to find out the source of infection using USG, Chest X-ray and clinically and treated accordingly. Suggesting that although CRP is a reliable marker but it can't be trusted more than clinical parameter like temperature. Out of these 5 patients, 4 patients were having high TLC suggesting that TLC can guide us in suspecting PIC in such category.

In third group (6 patients), where we didn't find any dramatic rise of CRP & temperature but TLC was found to be high we didn't make any changes in treatment and couldn't find any source of infection clinically and radiologically (USG, X-ray). Such patients were discharged satisfactorily without any PIC on follow up. Suggesting that rise of TLC can't be trusted over clinical parameter like temperature, clinical examination and CRP values.

In fourth group (23 patients), we didn't find any PIC clinically (history, examination, temperature) as well as there was no dramatic rise in CRP and TLC was within normal range.

In fifth group (9 patients), although there was dramatic rise in CRP but we didn't find any PIC clinically (history, examination, temperature) and TLC was within normal range. No change in treatment made in such patients and patient discharged satisfactorily.

In 6<sup>th</sup> group (5 patients), although there was rise in temperature but there was no dramatic rise in CRP and TLC was also within normal range. We didn't find any PIC in such patients after thorough examination. Such patients were also discharged satisfactorily. Suggesting that slight rise in temperature can be due to subclinical infection which have resolved because of treatment going on or it may be an inflammatory response. Suggesting that slight rise in temperature is not always an indicator of PIC.

Now if we analyse the group we can easily find out that out of 24 patients who were diagnosed with PICs, 19 patients were having dramatic rise of CRP, 24 patients were having high TLC on same day (17) or on second day (7) and 17 patients were having rise in temperature on same day and 2 patients on second day. All of these suggest that although no one can detect PIC for 100% combining dramatic rise in CRP and clinical suspicion (rise in temperature) can be justified as tool to diagnose PIC as early as possible.

## CONCLUSION:

Although clinical suspicion of PIC is the best single modality for diagnosis but combination of CRP with clinical suspicion (history, examination and temperature) helps in identifying PIC earliest. Moreover rise in TLC in previous category make the diagnosis stronger.

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