



CHANGES IN MONOCYTE COUNT DURING PRE- OPERATIVE AND FIRST POST OPERATIVE DAYS

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ABSTRACT

Stress is induced by various physical and psychological factors called Stressors. Surgery is a procedure to treat various diseases where the body is injured to remove the diseased part and correct the diseased part. Leucocytes play very important role in protecting the body during stressful conditions that is in the state of threatened homeostasis. The main objective of this study was to identify the changes in monocyte count by Differential Leucocyte Count with Leishman Staining technique during pre-operative and first post operative days in adults posted for elective surgery to predict the post operative outcome. Monocyte count during pre operative day was compared to first post-operative day in 50 subjects who were undergoing elective surgery showed significant decrease with p -value <0.0001 . Monocyte count is used to monitor the responses to stress caused by surgery.

Keywords: Differential Leucocyte Count, Leishman Staining technique, Monocyte count, Pre-operative day, First post operative day

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INTRODUCTION

Surgery is a procedure introduced and is in use since the time of Sushruta to treat various diseases. Surgery is done as emergency procedure or Elective Procedure. And various advances have come into light like Laparoscopy, which is a minimal invasive procedure used to reduce the stress of surgery on the diseased person. The scope of surgical care over recent decades has continued to expertise. A multitude of different diseases are managed surgically. Surgery produces tissue damage and acute inflammation. The thought or experience of undergoing surgery is known to induce a short term Fight & Flight response.

Blood is a complex fluid made up of fluid portion called as plasma and cellular elements like RBC, WBC and Platelets. The WBC or leucocytes are the soldiers which defend the body against harmful microorganisms and other injurious agents. Stress induced increase in plasma corticosteroids was accompanied by a significant decrease in number & percentage of lymphocytes and increase in number & percentage of neutrophils. Changes were rapidly induced under conditions of mild acute stress. Endogenous corticosteroids modulate any the interleukin 6 responses to surgery.

Materials and Methods

The study was conducted at Kurnool Medical College, in the department of Physiology, department of surgery in Government General Hospital, Kurnool in Andhra Pradesh for the selection of subjects. Prior to the study consent was obtained from the College Ethical Committee and written consent was obtained from the subjects. Each subject was informed about the aim of the research protocol and the methods to be used. Along with routine pre-operative lab investigations, Differential Leucocyte Count of the pre operative and post operative blood samples was done using Leishman Staining technique.

A total of 50 adult subjects of both sex groups posted for elective surgery like Hernia repair, Hydrocele, Cholecystectomy, Excision of Lipoma and Dermoid with no signs of infection pre-operatively, without any hormonal therapy and blood transfusion during pre and post operative period were selected. Under strict aseptic precautions by using sterile disposable syringes on the day of admission prior to surgery and first post operative day 1ml of venous blood was collected for Differential Leucocyte Count. DLC was performed by using Leishman Staining technique. Monocytes were identified according to their size, nucleus, cytoplasm color, cytoplasmic and nuclear ratio.

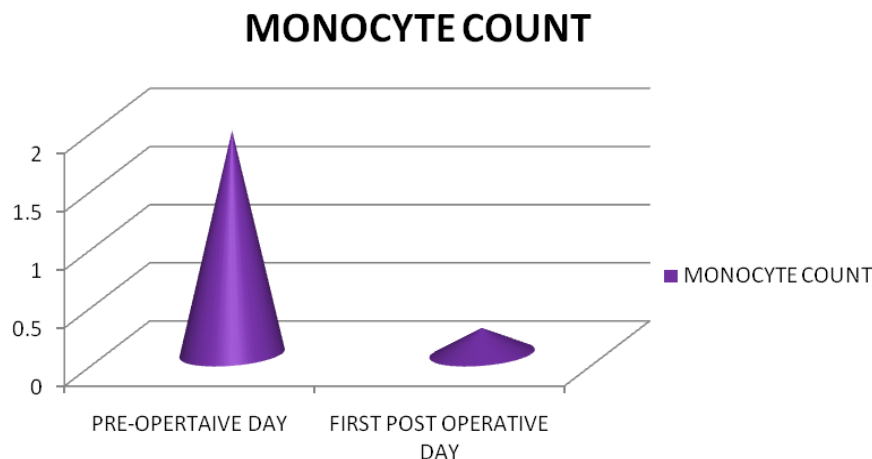
RESULTS

A total of 50 subjects of both sex groups were examined. Monocyte count was significantly affected on first post-operative day. Pre-operative and first post operative day monocyte count was considered as control group and case group respectively. The data obtained was analyzed by using unpaired student's t-test for difference of means with unequal variances for statistical analysis.

TABLE SHOWING COMPARISON OF MONOCYTE COUNT DURING PRE- OPERATIVE AND FIRST POST OPERATIVE DAYS

PARAMETER	PRE-OPERATIVE DAY (MEAN±SD)	FIRST POST OPERATIVE DAY (MEAN±SD)	p-VALUE
MONOCYTE COUNT	1.92±1.19	0.22±.042	<0.0001

There is a significant decrease in monocyte count during first post operative day when compared to pre-operative day as shown in the graph.



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DISCUSSION

Alterations in the relative proportions of different leucocytes were a measure of reactions of the body to various noxious agents. Post operative alterations in the number of various leucocytes play an important role in the acute inflammation, wound healing & immunity of the host. The stress response to surgery compromises a number of hormonal changes initiated by neuronal activation of the Hypothalamic Pituitary Axis. The endocrine response is activated by the afferent impulses from the site of injury. These travel along

sensory Nerve roots then through the dorsal root of the spinal cord up to the mid brain to activate the hypothalamus.

During acute stress, stress hormones may help in enhancing the immunity functionally, informing the immune system about impending challenges like wounding or injury that may be imposed by a stressor. Female sex hormones produce salutatory effects following trauma or hemorrhage where as male sex hormones are suppressive to immune and cardiac functions under stress conditions like trauma hemorrhage. Inflammation is followed by a second phagocytic phase characterized by infiltration of the injured site with neutrophils and monocytes. Monocytes orchestrate the intensity of inflammatory response to initiate the process of specific immunity.

CONCLUSION

The decrease in monocyte count during first post operative day may be regulated by the neuro-endocrine axis. During uncomplicated conventional surgeries the immune response goes clinically unnoticed without any harmful effects. Absent responses, excessive high responses on the other hand harm the patient. The right kind of stress response can lead to quick recovery of surgical patients. The assessment of changes in the leucocytes subsets is an easy simple in expensive reliable prognostic index to determine host immunity and survival rate.

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