Research Article

www.ijrap.net

A CLINICAL EVALUATION OF SHIGRUGUGGULU ON LIVER FUNCTION TEST UNDER SPINAL ANAESTHESIA

Maurya B.N[1], Byadgi P.S[2]*, Pande D.N[3]

[1]Medical Officer, Government Ayurvedic College and Hospital, Varanasi, India

[2]Assistant Professor, Department of Vikriti Vigyan, Faculty of Ayurveda, IMS, Banaras Hindu University Varanasi, India

[3]Professor, Department of Sangyaharan, IMS, Banaras Hindu University Varanasi, India

Received on: 19/06/14 Revised on: 29/07/14 Accepted on: 23/08/14

***Corresponding author**

Dr. Parameswarappa Shivappa Byadgi, Assistant Professor, Department of Vikriti Vigyan, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005 UP, India E-mail: psbyadgi@rediffmail.com

DOI: 10.7897/2277-4343.05488

ABSTRACT

Shigruguggulu is anubhoota yoga of Banaras Hindu University using as analgesic and anti-inflammatory since long time in the Shalya Ward and OPD of the Sir Sunderlal Hospital, Banaras Hindu University. Present research work was done on 150 healthy patients. The patients were divided into three Groups. Each Group included 50 patients with age (16-60 years), height and weight distribution. The patients were posted for primary threading, herniotomy with herniorrhaphy and hemorrhoidectomy, skin grafting, sentinel tag, tubectomy and abdominal hysterectomy. Group I was pre medicated with two capsules of Shigruguggulu 500 mg (2/3 part of Shigru root bark decoction and 1/3 Shigru root bark choorna with guggulu) orally at 10 pm and 90 minute before anesthesia and inj. Glycopyrrolate 0.2 mg IM, 60 minute before anesthesia. Group II was pre medicated with two capsules of Shigruguggulu 500 mg (Shigru root bark decoction with guggulu) orally at 10 pm and 90 minute before anesthesia and inj. Glycopyrrolate 0.2 mg IM, 60 minute before anesthesia. Group III was pre medicated with tab. Diclofenac sodium 50 mg orally 10 pm and 90 minute before anesthesia and inj. Glycopyrrolate 0.2 mg IM 60 minute before anesthesia. It was observed that no alteration in Mean Blood Pressure, respiratory rate, pulse rate, temperature and liver function test etc. Post anesthetic sequel, like nausea, vomiting, headache, backache, CNS irritability was observed insignificant in all the three Groups. It means that drug has no any side effect.

Keywords: Shigruguggulu, anesthesia, Mean Blood Pressure, Diclofenac sodium, Shigru, Guggulu

INTRODUCTION

Shigruguggulu is not mentioned in ancient literature. Shigruguggulu is anubhoota yoga of Banaras Hindu University using as analgesic and anti-inflammatory since long time in the Shalya Ward and OPD of the Sir Sunderlal Hospital, Banaras Hindu University. In order to understand the total properties and action of Shigruguggulu, it is necessary to go in the details of individual drug. Shigruguggulu is a compound drug made up of Shigru bark and Guggulu[3]. Various experimental and clinical studies have been done previously, by using different medicinal plants and indigenous compounds. Shigru (*Moringa oleifera*) and Guggulu (*Commiphora wightii*) were also evaluated by previous workers both clinically and experimentally for different purposes. In the present research work an indigenous drug Shigruguggulu was evaluated for its efficacy as an anti-inflammatory, analgesic, in the post operative pain management under lumber subarachnoid block (LSAB)[6-8].

Collection and Preparation of Drugs

Shigru (*Moringa oleifera*) was collected from the Ayurvedic garden of the Institute of Medical Sciences, Banaras Hindu University, Varanasi, India and Guggulu (*Commiphora wightii*) was taken from market. After confirming its validity, coarse powder of Shigru was prepared (after the shigru bark was dried under shade) and guggulu shodhana was done in cow milk. There are two methods of preparation of Shigruguggulu as below-

- Equal part of Shigru bark and Shuddha guggulu was taken. Then the decoction of 2/3 part of Shigru bark powder was prepared and filtered. It was evaporated on mild heat. Then shuddha guggulu was mixed. The 1/3 remaining part of fine Shigru powder was also mixed and solidified on mild heat to make tablet or vati of Shigruguggulu. (Ayurvedic Pharmacy, Institute of Medical Sciences, BHU formula)
- Equal amount of Shigru powder and guggulu was taken and decoction of Shigru was prepared and it was mixed (dissolved) with shuddha guggulu on mild heat. Then semi-solid material was dried and tablets or vati were formed. (Classical method of preparation of Shigruguggulu)

This 1st method was adopted in Ayurvedic Pharmacy of Institute of Medical Sciences, Banaras Hindu University. And 2nd method is classical preparation of Shigruguggulu. Thus trial drug Shigruguggulu (both preparation) was prepared by Ayurvedic Pharmacy of Institute of Medical Sciences, Banaras Hindu University, Varanasi, India supplied for this study[1-5].

Drug Presentation

500 mg of fine powder of Shigruguggulu was filled in each capsule for prescribing the patients of this study. Inert ingredients in the formulation of capsule which is lactose, maize starch, magnesium stearate and sodium lauryl sulphate.

Dose of Shigruguggulu

Shigruguggulu 1 g (2 capsules) at 10 pm and 1 g (2 capsules) 90 minute before the operation was the standard dose regime for the trial Groups.

Selection of the Patients

In the present study 150 patient of A.S.A. (American Society of Anaesthesiologists) grade I and II undergoing, herniotomy with herniorrhaphy, skin grafting, primary threading, hemorrhoidectomy, tubectomy (tube ligation) and abdominal hysterectomy were selected for this study from the Sushruta and Kashyap ward of the Sir Sunder Lal Hospital, Banaras Hindu University. The patients, selected were the standard population of age Group (16 year to 60 year) and similar physique. All patients were to undergo lumber subarachnoid block (LSAB). The patients with deformities of spinal card, neurological and mental disturbances, hepatic diseases, and renal disorders, cardiovascular diseases, hypersensitive to local anesthetic and diclofenac sodium and with local infection were excluded. The study was conducted after proper written consent of individual patients explaining the methodology and aim of the study. Institute ethical committee approval was taken for the study.

Grouping of Patients

The 150 selected patients were randomly divided into three equal Groups of 50 patients each. Group I consists of 50 patients, were given Shigruguggulu 1 g (2 capsules of 500 mg) at 10 pm and 90 minute before the operation. Group II consists of 50 patients, were given Shigruguggulu 1 g (2 capsules of 500 mg) At 10 pm and 90 minute before the operation. Group III consists of 50 patients were given tab. diclofenac sodium 50 mg at 10 pm and 90 minute before operation and labeled as control Group /Group 3rd.

Disintegration Time

The disintegration time of the prepared capsule at 37^{o}C of water was observed in the disintegration time machine. The time required for complete disintegration of capsule was found 21 minute for Group I Shigruguggulu and Group II Shigruguggulu was 30 minute. The capsules of Shigruguggulu were expected to dissolve in the stomach within their disintegration time.

Preoperative Preparation and Premedication

All the patients were assessed thoroughly and consent was taken about the proposed research work. Their age (years), weight (kg), and height (cm) and vital signs viz. pulse rate, blood pressure, respiratory rate, and temperature, peripheral saturation of oxygen and end tidal carbon dioxide were recorded. General condition, physiological and psychological conditions were also recorded. The relevant routine investigations which are essential prerequisite for the conduct of anesthesia were evaluated and after complete satisfaction the grouping was done. Early morning soap water enema was given for bowel preparation to the patients of each group accordingly. The number of patients and nature of premedication in the selected three groups detailed below-

Groups	Number of patients	Nature of premedication
Groups I (Ayurvedic Pharmacy, Institute of Medical Sciences, BHU formula)	50	Two capsules of Shigruguggulu (each 500mg) at 10 pm (previous night) and 90 minutes before anaesthesia. Prepared by commercial method i.e. 2/3 part of shigru root bark decoction and1/3 part of shigru root bark powder with guggulu. Inj. Glycopyrrolate 0.2mg I.M. 1hr before the anaesthesia.
Group II (Classical method of preparation of Shigruguggulu)	50	Two capsules of Shigruguggulu (each 500mg) at 10 pm (previous night) and 90 minutes before operation. Prepared by standard classical method i.e. shigru root bark decoction with guggulu. Inj. Glycopyrrolate 0.2mg I.M. 1hr before the anaesthesia.
Group III (Control)	50	Tab. of Diclofenac 50mg at 10.00 pm (previous night) and 90 minutes before operation. Inj. Glycopyrrolate 0.2mg I.M. 1hr before the anaesthesia.

One hour after premedication with inj. Glycopyrrolate, the patients were re-evaluated thoroughly regarding their vital signs, physiological and psychological conditions etc. and recorded on the standard proforma for the study. Now a patent intravenous line with ringer lactate solution was maintained by identical size intravenous cannula (Venflon – 18G). After adequate preloading, the patients were transferred to operation table. The induction of anesthesia was done by lumber subarachnoid block (LSAB) in right / left lateral position keeping their head on the pillow. Now proper antiseptic dressing and draping of the lumber area was done. Lumber puncture was done in all the cases by using thin size (25 G) spinal needle by midline approach. After ensuring free flow CSF at the rate of 1 drop/sec inj. Bupivacaine 0.5 % (heavy) 2.4 ml was administered. Needle was withdrawn and the area of skin prick was covered with sterile gauze piece. The patients were asked to change their posture to supine position with the help of assistant and adequate regional block was diagnosed by absence of pin prick and touch sensation in operative area.

Statistical Analysis

All the data collected Viz. – Age, weight, height, blood pressure, pulse rate, respiratory rate, oral temperature, liver function test and post anesthetic sequel etc., were recorded in a properly planned manner with the help of statistician on a master chart. The different statistical values as advocated for comparison e.g. mean, standard deviation (SD), applying paired t-test, one way ANOVA test and post hoc test, standard error, p-value, z-value, using percentage of incidence and degree of freedom etc, were calculated under the guidance of expert statistician. The observations were noted and were also presented in graphical way.

RESULTS

Effect on Serum Bilirubin

Table 1A: Mean of serum bilirubin (mg/dl) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT), and comparison within the Groups paired't' test

	Mean of serum Bilirubin (mg/dl) ± SD		
Groups	**Before premedication (BT)**	**After recovery from anesthesia (AT)**	**Within the Group comparison (Paired t test)**
Group I	0.94 ± 0.09	0.99 ± 0.23	t = 1.46 P = 0.150 NS
Group II	0.92 ± 0.18	0.99 ± 0.10	t = 2.59 P = 0.080 NS
Group III (Control)	0.92 ± 0.12	0.94 ± 0.103	t = 0.25 P = 0.802 NS

From Table 1A it is observed that mean of serum bilirubin (mg/dl) in Group-I at the label of before premedication (BT) and after recovery from anesthesia (AT) was 0.94 ± 0.09 and 0.99 ± 0.23 respectively. When it was compared within the groups (Paired 't' test) it was not significant. Mean of serum Bilirubin (mg/dl) in Group-II before premedication (BT) and after recovery from anesthesia (AT) was 0.92 ± 0.18 and 0.99 ± 0.10 respectively. When it was compared within the groups (Paired 't' test) it was not significant. Mean of serum Bilirubin (mg/dl) in Group-III before premedication (BT) and after recovery from anesthesia (AT) was 0.92 ± 0.12 and 0.94 ± 0.103 respectively. When it was compared within the Groups (Paired t test) it was not significant.

Table 1B: Mean of serum Bilirubin (meq/l) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT) and comparison between the Group by one way ANOVA test and post hoc test

Tests	**Before premedication (BT)**	**After recovery from anesthesia(AT)**
Compare between the Group by one way ANOVA test	F = 1.13 P = 0.090 NS	F = 1.471 P = 0.233 NS
post hoc test I vs. III II vs. III	 P = 0.985 NS P = 0.750 NS	 P = 0.239 NS P = 0.239 NS

From Table 1B it is observed that the mean of serum Bilirubin (meq/l) in between the groups by one way ANOVA test at the label of before premedication (BT) and after recovery from anesthesia (AT) are not significant. Post Hoc test of group 1 vs. Group 3 is not significant at the label of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 is not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Effect on Serum Protein

Table 2A: Mean of serum protein (g/dl) in Group-I, Group-II and Group III, before premedication (BT) and after recovery from anesthesia (AT), and comparison within the Groups Paired t test

	Mean of serum protein (g/dl) ± SD		
Groups	**Before premedication (BT)**	**After recovery from anesthesia (AT)**	**Within the Group comparison (Paired t test)**
Group I	7.57 ± 0.97	7.49 ± 0.59	t = 0.60 P = 0.553 NS
Group II	7.51 ± 0.55	7.36 ± 0.61	t = 0.990 P = 0.380 NS
Group III (Control)	7.57 ± 0.74	7.46 ± 0.72	t = 1.46 P = 0.157 NS

From Table 2A it is observed that mean of serum protein (g/dl) in Group-I at the label of before premedication (BT) and after recovery from anesthesia (AT) was 7.57 ± 0.97 and 7.49 ± 0.59 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum protein (g/dl) in Group-II before premedication (BT) and after recovery from anesthesia (AT) was 7.51 ± 0.55 and 7.36 ± 0.61 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum protein (g/dl) in Group III before premedication (BT) and after recovery from anesthesia (AT) was 7.57 ± 0.74 and 7.46 ± 0.72 respectively. When it was compared within the groups (Paired t test) it was not significant.

Table 2B: Mean of serum protein (g/dl) in Group-I ,Group-II and Group III, before premedication (BT) and after recovery from anesthesia (AT) and comparison between the Group by one way ANOVA test and post hoc test

Tests	Before premedication (BT)	After recovery from anesthesia (AT)
compare between the Group by one way ANOVA test	F = 0.995 P = 0.372 NS	F = 0.606 P = 0.547 NS
post hoc test I vs. III II vs. III	 P = 0.468 NS P = 0.943 NS	 P = 0.956 NS P = 0.635 NS

From Table 2B it is observed that the mean of serum protein (g/dl) when compared between the groups by one way ANOVA test at the label of before premedication (BT) and after recovery from anesthesia (AT) were not significant. Post Hoc test of Group 1 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Effect on Serum Albumine

Table 3A: Mean of serum albumin (g/dl) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT), and comparison within the groups Paired t test

	Mean of serum albumin (g/dl) ± SD		
Groups	**Before premedication (BT)**	**After recovery from anesthesia (AT)**	**Within the Group comparison (Paired t test)**
Group I	4.26 ± 0.66	4.18 ± 0.58	t = 1.48 P = 0.145 NS
Group II	4.42 ± 0.51	4.36 ± 0.51	t = 2.31 P = 0.090 NS
Group III (Control)	4.47 ± 0.58	4.34 ± 0.67	t = 1.386 P = 0.081 NS

From Table 3A it is observed that mean of serum albumin (g/dl) in Group-I before premedication (BT) and after recovery from anesthesia (AT) was 4.26 ± 0.66 and 4.18 ± 0.58 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum albumin (g/dl) in Group-II before premedication (BT) and after recovery from anesthesia (AT) was 4.42 ± 0.51 and 4.36 ± 0.51 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum albumin (g/dl) in Group III before premedication (BT) and after recovery from anesthesia (AT) was 4.47 ± 0.58 and 4.34 ± 0.67 respectively. When it was compared within the groups (Paired t test) it was not significant.

Table 3B: Mean of serum albumin (g/dl) in Group-I, Group-II and Group III, before premedication (BT) and after recovery from anesthesia (AT) and comparison between the Groups by one way ANOVA test and post hoc test

Tests	Before premedication (BT)	After recovery from Anesthesia (AT)
Compare between the Group by one way ANOVA test	F = 2.547 P = 0.072 NS	F = 1.324 P = 0.269 NS
post hoc test I vs. III II vs. III	 P = 0.154 NS P = 0.336 NS	 P = 0.318 NS P = 0.979 NS

From Table 3B it is observed that the mean of serum albumin (g/dl) when compared between the Groups by one way ANOVA test at the label of before premedication (BT) and after recovery from anesthesia (AT) were not significant. Post Hoc test of Group 1 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Effect on Serum Glutamic-oxaloacetic Transaminase (SGOT)/(AST)

Table 4A: Mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT), and comparison within the groups (Paired t test)

	Mean of serum glutamic-oxaloacetic transaminase (SGOT)(IU/L) ± SD		
Groups	**Before premedication (BT)**	**After recovery from anesthesia (AT)**	**Within the Group comparison (Paired t test)**
Group I	35.56 ± 10.98	35.28 ± 6.86	t = 0.18 P = 0.855 NS
Group II	46.96 ± 17.65	45.12 ± 12.53	t = 0.94 P = 0.354 NS
Group III (Control)	35.48 ± 10.08	34.32 ± 6.65	t = 0.78 P = 0.440 NS

From Table 4A it is observed that mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) in Group-I at the label of before premedication (BT) and after recovery from anesthesia (AT) was 35.56 ± 10.98 and 35.28 ± 6.86 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) in Group-II at the label of before premedication (BT) and after recovery from anesthesia (AT) was 46.96 ± 17.65 and 45.12 ± 12.53 respectively. When it was compared within the groups (Paired t test) it was not significant. Mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) in Group III at the label of before premedication (BT) and after recovery from anesthesia (AT) was 35.48 ± 10.08 and 34.32 ± 6.65 respectively. When it was compared within the Groups (Paired t test) it was not significant.

Table 4B: Mean of serum glutamic-oxaloacetic transaminase (SGOT)(IU/L) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT) and comparison between the Groups by one way ANOVA test and post hoc test

Tests	Before premedication (BT)	After recovery from anesthesia (AT)
comparison between the Group by one way ANOVA test	F = 1.260 P = 0.080 NS	F = 1.558 P = 0.090 NS
post hoc test I vs. III II vs. III	 P = 0.999 NS P = 0.178 NS	 P = 0.819 NS P = 0.345 NS

From Table 4B it is observed that the mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) when compared between the Groups by one way ANOVA test before premedication (BT) and after recovery from anesthesia (AT) were not significant. Post Hoc test of Group 1 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Effect on Serum Glutamic Pyruvic Transaminase (SGPT)/ (ALT)

Table 5A: Mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT), and comparison within the groups by Paired t test

	Mean of serum glutamic pyruvic transaminase (SGPT)(IU/L) ± SD		
Groups	Before premedication (BT)	After recovery from anesthesia (AT)	Within the Group comparison (Paired t test)
Group I	50.20 ± 16.69	53.24 ± 19.63	t = 1.42 P = 0.162 NS
Group II	50.32 ± 25.15	53.86 ± 19.67	t = 0.77 P = 0.445 NS
Group III (Control)	50.24 ± 19.05	53.52 ± 19.59	t = 1.17 P = 0.083 NS

From Table 5A it is observed that mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) in Group-I at the label of before premedication (BT) and after recovery from anesthesia (AT) was 50.20 ± 16.69 and 53.24 ± 19.63 respectively. When it was compared within the groups by paired t test it was not significant. Mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) in Group-II is before premedication (BT) and after recovery from anesthesia (AT) was 50.32 ± 25.15 and 53.86 ± 19.67 respectively. When it was compared within the Groups by paired t test it was not significant. Mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) in Group III is before premedication (BT) and after recovery from anesthesia (AT) was 50.24 ± 19.05 and 53.52 ± 19.59 respectively. When it was compared within the groups by paired t test it was not significant.

Table 5B: Mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) in Group-I Group-II and Group III, before premedication (BT) and after recovery from anesthesia (AT) and comparison between the Groups by one way ANOVA test and post hoc test

Tests	Before premedication (BT)	After recovery from anesthesia (AT)
Compare between the Group by one way ANOVA test	F = 1.92 P = 0.081 NS	F = 1.700 P = 0.091 NS
post hoc test I vs. III II vs. III	 P = 0.838 NS P = 0.074 NS	 P = 0.256 NS P = 0.090 NS

From Table 5B it is observed that the mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) when compare between the Groups by one way ANOVA test at the label of before premedication (BT) and after recovery from anesthesia (AT) were not significant. Post Hoc test of Group 1 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Effect on Serum Alkaline Phosphatase

Table 6A: Mean of serum alkaline phosphatase (U/L) in Group-I, Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT), and comparison within the groups Paired t test

	Serum alkaline phosphatase (U/L) ± SD		
Groups	**Before premedication (BT)**	**After recovery from anesthesia (AT)**	**Within the Group comparison (Paired t test)**
Group I	109.00 ± 16.05	110.00 ± 18.52	t = 0.87 P = 0.387 NS
Group II	112.72 ± 22.89	113.36 ± 23.62	t = 0.38 P = 0.705 NS
Group III (Control)	111.12 ± 26.33	110.64 ± 25.34	t = 0.49 P = 0.625 NS

From Table 6A it is observed that mean of serum alkaline phosphatase (U/L) in Group-I at the label of before premedication (BT) and after recovery from anesthesia (AT) was 109.00 ± 16.05 and 110.00 ± 18.52 respectively. When it was compared within the groups by paired t test wat was not significant. Mean of serum alkaline phosphatase (U/L) in Group-II before premedication (BT) and after recovery from anesthesia (AT) was 112.72 ± 22.89 and 113.36 ± 23.62 respectively. When it was compared within the Groups by paired t test it was not significant. Mean of serum alkaline phosphatase (U/L) in Group III at the label of before premedication (BT) and after recovery from anesthesia (AT) was 111.12 ± 26.33 and 110.64 ± 25.34 respectively. When it was compared within the groups by paired t test it was not significant.

Table 6B: Mean of serum alkaline phosphatase (U/L) in Group-I , Group-II and Group III at the label of before premedication (BT) and after recovery from anesthesia (AT) and comparison between the groups by one way ANOVA test and post hoc test

Tests	**Before premedication (BT)**	**After recovery from anesthesia (AT)**
compare between the Group by one way ANOVA test	F = 0.354 P = 0.702 NS	F = 0.251 P = 0.779 NS
post hoc test		
I vs. III	P = 0.848 NS	P = 0.999 NS
II vs. III	P = 0.910 NS	P = 0.773 NS

From Table 6B it is observed that the mean of serum alkaline phosphatase (U/L) when compared between the groups by one way ANOVA test before premedication (BT) and after recovery from anesthesia (AT) were not significant. Post Hoc test of Group 1 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT). Again Post Hoc test of Group 2 vs. Group 3 was not significant at the level of before premedication (BT) and after recovery from anesthesia (AT).

Changes of Vital Signs [Blood Pressure (BP in mmHg)]

The cardiovascular depression or excitement is manifested by the change in blood pressure. Both systolic and diastolic pressure was recorded. The mean blood pressure was calculated by the method of Jennings (1969).

Mean B.P. = Diastolic pressure + 1/3 of pulse pressure
[Pulse Pressure = Systolic B.P. – Diastolic B.P.]

Any change in the M.B.P. at different stages of study was recorded. B.P. was recorded before premedication and supposed as base line. Change in blood pressure was again recorded after premedication, during subsequent anesthesia and after recovery from anesthesia. It was compared in same groups (within the Groups) at different time using paired t-test and between the Groups at corresponding identical time by using one way ANOVA test and Post Hoc test.

Pulse Rate (PR/minute)

At every step of study, any fall or rise in pulse rate was recorded. Pulse rate was recorded before premedication and supposed as base line. Change in pulse rate was again recorded after premedication, during subsequent anesthesia and after recovery from anesthesia, it was compared in the same groups (within Groups) at different time by using paired t-test and between the groups at corresponding identical time by using one way ANOVA test and Post Hoc test.

Surgical Time

Time from starting surgical procedure to the completion of surgery was recorded as surgical time. All vital signs were recorded as described earlier. The physiological and total psychological changes during subsequent anesthesia was observed and recorded.

Total Anesthetic Time

The time from the end of induction to start of sensation of pain by gently pin prick to the perineal region and perception of touch in tower limbs was also noted.

DISCUSSION

The patients of all groups had similar age, height and weight. It was observed that changes in Mean Blood Pressure, between the groups at different level was insignificant and within the group at different level was almost similar. So this can be explained that there was no alteration in CVS of patients of all the groups. It means that the trial and control drugs do not produce any side effect on CVS. Pulse rate change in between the groups at

different level was almost insignificant and within the group at different level was also insignificant in all the groups. So this can be explained that the identical changes in pulse rate show that there was cardiovascular stability during the whole procedure. It was observed that changes in mean of serum Bilirubin (mg/dl) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. It was observed that changes in mean of serum protein (g/dl) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. It was observed that changes in mean of serum Albumin (g/dl) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. It was observed that changes in mean of serum glutamic-oxaloacetic transaminase (SGOT) (IU/L) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. It was observed that changes in mean of serum glutamic pyruvic transaminase (SGPT) (IU/L) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. It was observed that changes in mean of serum alkaline phosphatase (U/L) between the groups at different level were almost similar and within the same group at different level was also almost similar in all the groups. This result proves that there was no adverse effect on liver. In present clinical trial the total mean surgical time was found statistically insignificant in the patient of all the three groups. As a matter of fact, duration of surgery influence many biophysical and neurohumoral changes which alters the response of drugs used at any stage of anesthesia. On comparison of mean anesthetic time (in minute) between the groups it was found insignificant statistically. The anesthetic time was observed in the patients and they were able to move their lower limbs and there was perception of touch in lower limbs. Thus the trial drug is safe anti-inflammatory analgesic drug that do not alter liver function test and can be used in post operative period in those case wherein oral intake was allowed for the management of pain. Even some patients did not require the second dose (in Group 2^{nd} n = 48, Group 3^{rd} n = 46) of analgesic. The Shothahar (anti-inflammatory), vedanahar (analgesic) property of Shigruguggulu is well established in Ayurvedic texts and it was used in all inflammatory painful conditions like Arthritis, Osteo-arthritis, etc. Pain is due to vitiation of Vata dosa. Shigru and Guggulu both are Vata shamak dravya. Due to Vata shamak property, Shigruguggulu is capable to relieve the pain produced by trauma of knife.

CONCLUSION

There were two varieties of Shigruguggulu as below-one was prepared as per Ayurvedic Pharmacy, Institute of Medical Sciences, BHU formula. Second one was prepared as Classical method. Shigruguggulu is anubhoota yoga of Banaras Hindu University using as analgesic and anti-inflammatory since long time in the Shalya Ward and OPD of the Sir Sunderlal Hospital, Banaras Hindu University. It was observed from the study that there was no alteration in Mean Blood Pressure, respiratory rate, pulse rate, temperature and liver function test etc by the use of Shigruguggulu. Post anesthetic sequel, like nausea, vomiting, headache, backache, CNS irritability was observed insignificant in all the three Groups. It means that drug has no any side effect. The anesthetic time was observed in the patients and they were able to move their lower limbs and there was perception of touch in lower limbs. Thus the trial drug is safe anti-inflammatory analgesic drug that do not alter the liver function test and can be used in post operative period in those case wherein oral intake is allowed for the management of pain.

REFERENCES

1. Berman KC. Management of Xeropthalmia by indigenous drug, Shigru and Goghrit; 1994.
2. Chaubey Anjana, Dixit SK, Sharma PV. Disintigration time of *Commiphora mukul* Thesis for M.D. Ras Shastra B.H.U.
3. Maurya BN. Evaluation of Shigruguggulu in Sangyaharan as Vedanahar (pain relieving) thesis of M.S. (Ay) Sangyahara, IMS BHU; 2004.
4. Medhi Champak, Pande DN. Evaluation of Shigru in Sangyaharan as Pre anesthetic agent; 2003.
5. Mishra PR. Guggulu in the management of post-operative pain, M.S. (Ay.) Sangyaharan Thesis, I.M.S., B.H.U., Varanasi; 1998.
6. Mukhopadhyay BN. Role of Shobhanjan in the management of granular conjunctivitis (Trachoma); 1987.
7. Singh HO. *et al*, Evaluation of Triphala guggulu in Post Operative Pain managements; 2000.
8. Vyas SN and Shukla CP. A clinical study on the effect of Shuddha Guggulu in rheumatoid arthritis. Rheumatism 1987; 23: 15.

Cite this article as:

Maurya B.N, Byadgi P.S, Pande D.N. A clinical evaluation of Shigruguggulu on liver function test under spinal anaesthesia. Int. J. Res. Ayurveda Pharm. 2014;5(4):428-434 http://dx.doi.org/10.7897/2277-4343.05488

Source of support: Nil, Conflict of interest: None Declared