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MANAGEMENT OF SIMPLE FRACTURE (KANDABHAGNA) WITH MANJISTHADI LEPA

Dr. Ajit Pradhan*

Department of Shalya Tantra Gopabandhu Ayurveda Mahavidyalaya and Hospital, V.I.P Road, Puri, Odisha, India.

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***Corresponding Author**
Dr. Ajit Pradhan
Department of Shalya Tantra Gopabandhu Ayurveda Mahavidyalaya and Hospital, V.I.P Road, Puri, Odisha, India.

ABSTRACT

Introduction: The Asthibhagna (Fracture) in general is always "Abhighataja". Industrialization, increase in population and busy life schedule increases the chance of accidents. Fracture not only restricts the physical movement but also cut the social, economical, psychological movements of patients. Improper management of fracture may lead to permanent disability. **Aim:** The anatomical union is not only the ultimate aim of the fracture treatment but it also focus on to reduce the future complication. It is an effort to evaluate the clinical efficacy of a multi herbal formulation manjishthadi lepa in the management of fracture. **Methodology:** 30 patients fulfilling the diagnostic and inclusion criteria belong to either sex and age ranging from 10 to 60 years were selected for this study. These patients were divided into trial and control groups. The patients of trial group treated with local application of Manjishthadi lepa for 6 week and immobilized by plaster of paris posterior slab. However the patients of control group treated only immobilization by plaster of paris cast. **Results:** Subjective and objective parameters are suitably graded to assess the results based on clinical observations before and after treatment. Statistically results were highly significant ($p < 0.001$) in criteria like pain, swelling, tenderness, joint movement, grip strength and callus formation. **Conclusion:** Manjisthadi lepa has Vedana-sthapana, Shothahara and Asthi sandhanak properties. Significant result is achieved in the trial group cases of Bhagna managed Manjisthadi lepa. From this clinical study it is proved that Manjisthadi lepa is highly effective in the management of Bhagna.

KEYWORDS: Asthibhagna, Plaster of Paris cast, Vedanasthapana, Sothahara.

INTRODUCTION

Since evolution of civilization, the care of human mass was categorically designed as medical care, in which trauma care has been regarded maximum importance. In the Vedic period the management of fracture was done with the help of Rohini Vanaspati. Since then there have been different mode of illustration of approaches in the field of orthopaedic management in Ayurvedic as well as modern medical science, which has been recognized as a special branch of medical science by the end of second world war. In the industrial world, road accidents alone claim 1 in 10,000 lives in each year. The World Health Organisation predicts that the road traffic injuries would become the sixth commonest cause of death by the year 2020 and the fifth by 2030. Limb injuries or fractures are the commonest, which determine the priorities in management. All the limbs are composed of long and short bones and these are much more prone for fracture. Keeping this view Nalakasthi Bhagna (fracture of long bone) is taken for the present study. As regards treatment, modern fracture management requires hospitalization including expensive materials and medicaments, which are usually not available in village and remote areas of our country. And due to lack of proper management many people have to live a disabled life forever. As on these days developed countries are heading promotion towards herbal system of medicine, which is the only harmless system of medicine left in this world of chemical advancement. So Ayurvedic system of medicine is the ancient Indian medical science, which deals with natural herbs that are to be torched on. Ayurvedic medicaments are prepared from the best available natural form of plant. To ensure the union and to get rid of associated sign symptoms at its earliest, the present day procedures often fail and lead to certain complications. In this context for evaluating ancient art of orthopaedic practice i. e. Ayurvedic approach to traditional conservative way of fracture management as described in Sushruta samhita has been selected for the research work with a view to assess the effectiveness of such medicaments and their possibilities in the present clinical practice. For this purpose the present clinical study entitled “Management of simple fracture (kandabhagna) with Manjisthadi lepa”. has been under taken.

AIM AND OBJECTIVES

1) To evaluate clinical efficacy of Manjisthadi lepa in the management of kandabhagna.
2) To evaluate its effectiveness in respect to the associated signs and symptoms.
3) To utilize the lepa in day to day practice of bhagna.

MATERIALS OF THE STUDY

Place

Gopabandhu Ayurveda Mahavidyalaya and Hospital and District Headquarter Hospital, Puri.

Patients

I) Total 30 number of patients were collected for the present study from OPD of Gopabandhu Ayurveda Mahavidyalaya & Hospital and District Headquarter Hospital, Puri.

II) The patients were divided into following 2 groups :- a) Group -1 Trial group b) Group -2 Control group.

Medicine

The ingredients of selected medicine for the present study i.e. Majisthadi lepa constituting Manjistha, Raktachandana, Yastimadhu, Sali pista, Satadhauta ghrita were procured from pharmacy of Gopabandhu Ayurveda Mahavidyalaya, Puri.

Investigations

For detailed clinical investigations to determine the exact condition of the patients, vivid clinical, pathological and bio-chemical radiological studies (X-ray) were under taken.

METHODS FOR THE STUDY

All cases were diagnosed on the basis of clinical sign and symptoms of fracture, such as pain at the site of fracture, tenderness, swelling, movement of adjacent joint involved and crepitus.

Besides this, diagnosis was confirmed by radiological examinations i.e. x-ray of the affected part.

Inclusion criteria

I) Patients of ages from 10 – 60 years were included in the study.

II) Both sex were included.

III) Only simple fracture of upper limbs.

IV) Only shaft of long bones (excluding clavicle).

Exclusion criteria

I) Comminuted fractures.

II) Other associated systemic disease like Diabetes, Tuberculosis, V.D. etc.

III) Pathological fractures like carcinoma, osteomyelitis, old age etc.
IV) Unstable fracture requiring internal fixation
V) Congenital bone disorder like osteogenesis imperfecta.
VI) Fracture with injured nerves and blood vessels.
VII) All fractures of lower limbs.

Design for statistical evaluation

The randomly selected patient were divided into two group i.e. Trial group, Control group. Method of drugs application in trial group.

After manipulation of the fractured part the lepa was applied. The direction of lepa was contrary to that of the local hair i.e. pratiloma direction. Thereafter the limb was covered with a cotton pad keeping the limb in reduced position. Lastly the limb is immobilized with posterior slab.

Preparation of lepa

The fine powder of Manjistha, Raktachandana, Yastimadhu and Salidhanya each in equal quantity and mixed with adequate quantity of shatadhauta ghrita before the application on the same day.

Thickness of lepa

The lepa was applied over the skin around the fractured bone with 3 centimeter above and below the fracture site. The thickness of lepa was 1/4th thickness of the finger i.e. approximately 0.5 centimeter.

Duration

After due application, the period of keeping lepa was for one week under immobilization. The lepa was removed under the process of warm water irrigation on 7th day and new lepa was again applied.

Number of applications

The number of applications was six times within a period of six weeks.

Management of control group

Here all the patients were given plaster of paris cast and required reduction, depending on the types of the fracture, was done and no other medicine was given to the patients.

ASSESSMENTS

The assessment of patients was made on the basis of improvement in the signs and symptoms regularly at an interval of 2 week.

ASSESSMENT PARAMETERS

A) **Subjective parameters**

1) Pain, 2) Swelling

B) Objective parameters

1) Tenderness, 2) Joint movement, 3) Grip strength, 4) Callus formation.

OBSERVATIONS AND RESULTS

Total 30 patients were registered, among them 15 patients in trial group & 15 patients in control group allocated randomly. One patient from trial group & two patients from control group were discontinued the treatment because they were willing to consult in private orthopaedic clinic. So, in this study, general observations were made on total 30 patients and results were made on total 27 patients as mentioned below.

Table 1: Demographic observation of registered patients.

Observations	Predominance	No. of patients	Percentage
Age	41 – 50 years	11	36.66
sex	Male	17	56.67
Nature of trauma	Direct	16	53.34
Occupation	Business	9	30
Area	Urban	23	76.66
Socio-economic status	Middle	12	40
Deformity	Visible	16	53.33
Mobility between fragments	Present	23	76.66
Crepitus	Present	23	76.66
Shortening	Present	17	56.67
Bone involvement	Radius	20	66.67
Bone segment	Distal	19	63.34
Fracture pattern	Transverse	23	76.67
Displacement	**Displaced**	**23**	**76.67**

Table 2: Showing the statistical analysis of pain between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ± SD	M.D ± SD	df (N- 1)	't' Value	'p' Value	Remarks
Pain	Trial Group	BT	1.5 ± 0.51		13			
		AT1	0.92±0.47	0.58±0.51		4.25	<0.001	HS
		AT2	0.21±0.42	1.29±0.46		10.49	<0.001	HS
		AT3	0.07±0.26	1.42±1.02		5.20	<0.001	HS
	Control Group	BT	1.53±0.51		12			
		AT1	1.46±0.51	0.07±0.27		0.93	>0.05	I
		AT2	0.69±0.48	0.84±0.37		8.18	<0.001	HS
		AT3	0.46±0.51	1.07±0.27		14.28	<0.001	HS

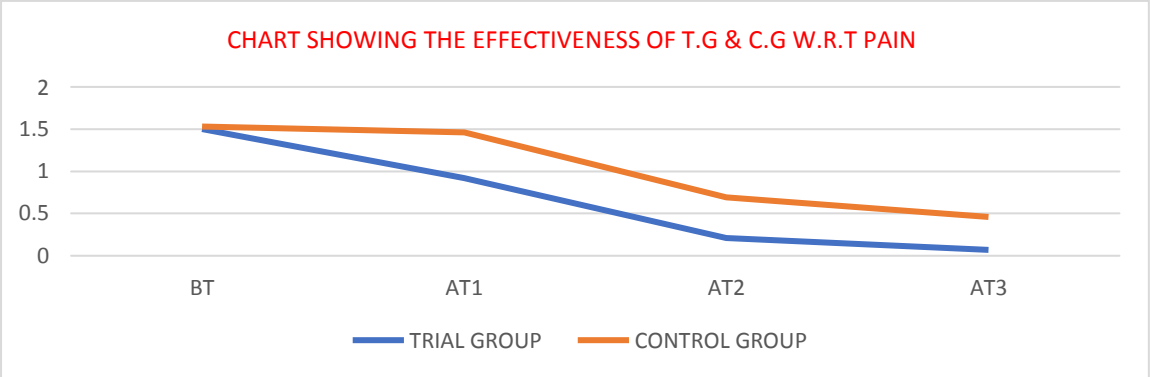


Table 3: Showing the statistical analysis of swelling between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ± SD	M.D ± SD	df (N- 1)	't' Value	'p' Value	Remarks
Swelling	Trial Group	BT	1.42±0.51		13			
		AT1	0.78±0.42	0.64±0.49		4.88	<0.001	HS
		AT2	0.35±0.49	1.07±0.26		15.39	<0.001	HS
		AT3	0.07±0.26	1.35±0.49		10.30	<0.001	HS
	Control Group	BT	1.46±0.51		12			
		AT1	1.23±0.43	0.23±0.43		1.92	>0.05	I
		AT2	0.61±0.50	0.84±0.37		8.18	<0.001	HS
		AT3	0.38±0.50	1.07±0.27		14.28	<0.001	HS

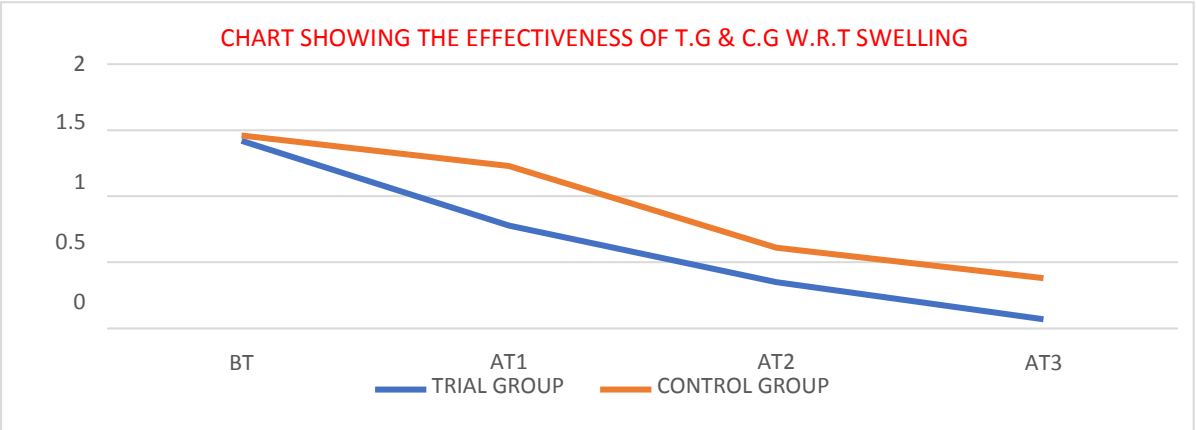


Table 4: Showing the statistical analysis of tenderness between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ± SD	M.D ±SD	Df (N- 1)	't' Value	'p' Value	Remarks
Tenderness	Trial Group	BT	2.57±0.51		13			
		AT1	1.71±0.46	0.85±0.36		8.83	<0.001	HS
		AT2	0.71±0.46	1.85±0.36		19.22	<0.001	HS
		AT3	0.14±0.36	2.42±0.51		17.75	<0.001	HS
	Control Group	BT	2.76±0.43		12			
		AT1	2.38±0.50	0.38±0.50		2.73	<0.02	S
		AT2	1.30±0.48	1.46±0.51		10.32	<0.001	HS
		AT3	0.38±0.50	2.38±0.51		17.16	<0.001	HS

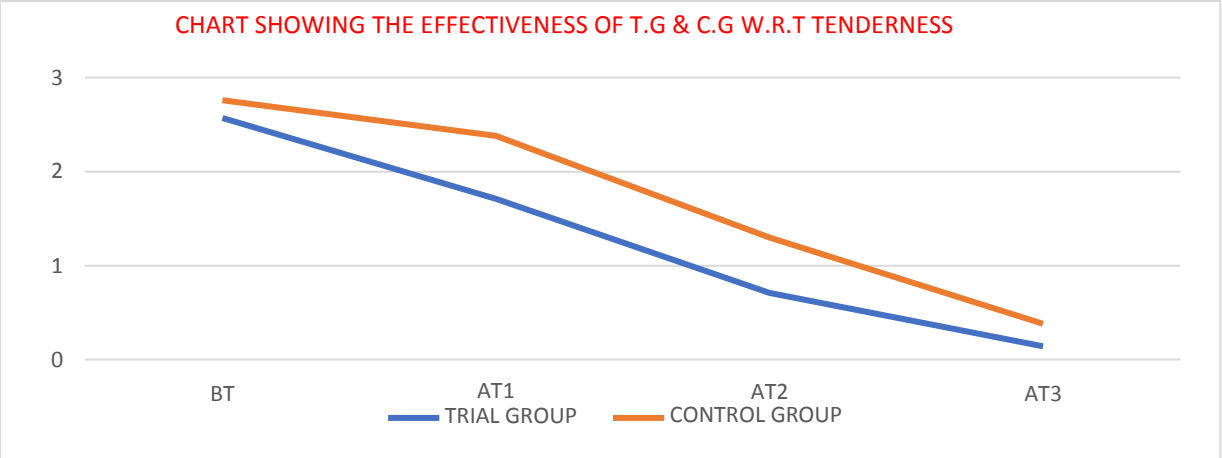


Table 5: Showing the statistical analysis of joint movement between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ± SD	M.D ±SD	Df (N- 1)	't' Value	'p' Value	Remarks
Point Movement	Trial Group	BT	1.5±0.51		13			
		AT1	2.21±0.69	0.71±0.46		5.77	<0.001	HS
		AT2	3.07±0.61	1.57±0.51		11.51	<0.001	HS
		AT3	3.78±0.42	2.28±0.46		18.54	<0.001	HS
	Control Group	BT	1.38±0.50		12			
		AT1	1.69±0.48	0.30±0.48		2.25	<0.05	S
		AT2	2.61±0.50	1.23±0.43		10.31	<0.001	HS
		AT3	3.61±0.50	2.23±0.43		18.69	<0.001	HS

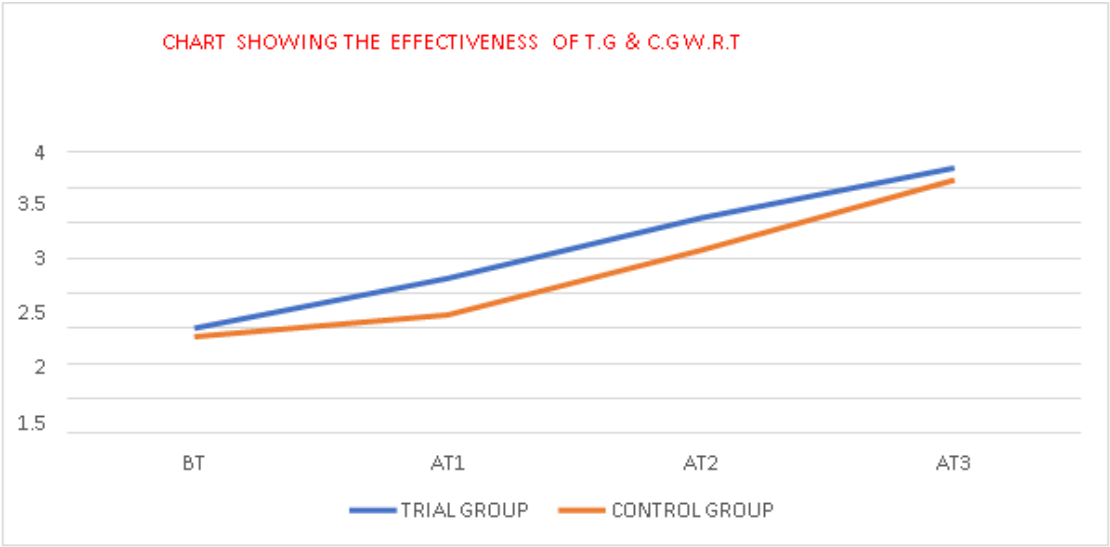


Table 6: Showing the statistical analysis of grip strength between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ±SD	M.D ±SD	Df (N- 1)	't' Value	'p' Value	Remarks
Grip Strength	Trial Group	BT	1±0		13			
		AT1	1.85±0.36	0.85±0.36		8.83	<0.001	HS
		AT2	2.92±0.26	1.92±0.26		27.63	<0.001	HS
		AT3	4.14±0.53	3.14±0.53		22.16	<0.001	HS
	Control Group	BT	1±0		12			
		AT1	1.53±0.51	0.53±0.51		3.74	<0.01	S
		AT2	2.53±0.51	1.53±0.51		10.81	<0.001	HS
		AT3	3.84±0.55	2.84±0.55		18.61	<0.001	HS

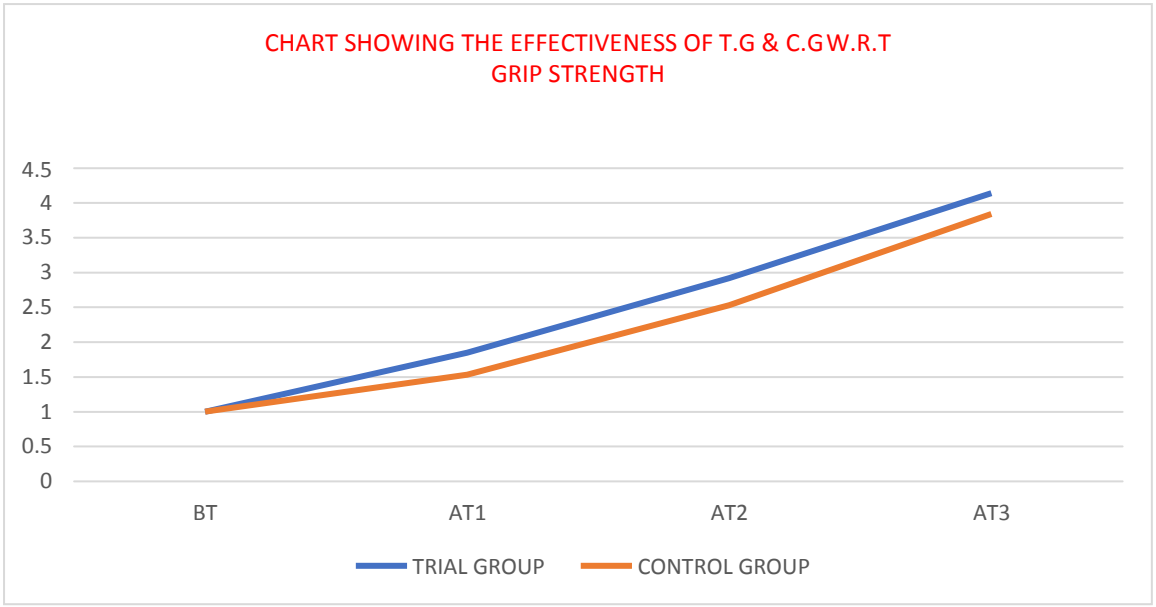
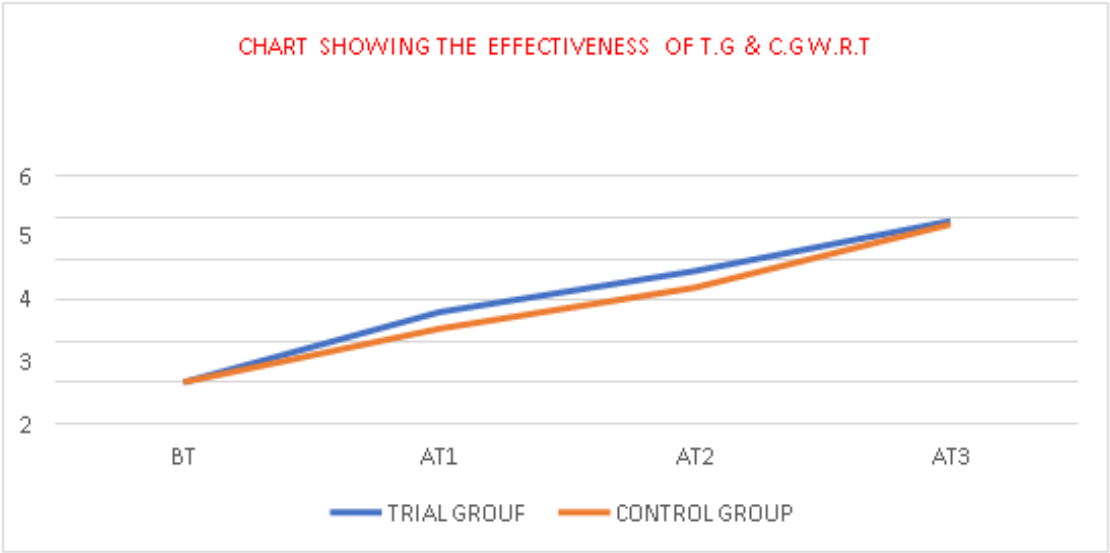


Table 7: Showing the statistical analysis of callus formation between trial and control group.

Sign and Symptoms	Treatment Groups	Duration	Mean ±SD	M.D ±SD	Df (N- 1)	't' Value	'p' Value	Remarks
Callus Formation	Trial Group	BT	1±0		13			
		AT1	2.71±0.46	1.71±0.46		13.90	<0.001	HS
		AT2	3.71±0.46	2.71±0.46		22.04	<0.001	HS
		AT3	4.92±0.26	3.92±0.26		56.41	<0.001	HS
	Control Group	BT	1±0		12			
		AT1	2.30±0.48	1.30±0.48		9.76	<0.001	HS
		AT2	3.30±0.48	2.30±0.48		17.27	<0.001	HS
		AT3	4.84±0.37	3.84±0.37		37.41	<0.001	HS



DISCUSSION

Demographic observations Age

In the course of present clinical study it was observed that the maximum patients i.e. 36.66% were under the age group 41-50 years. The incidence among the adult age group was maximum because of their exposure to outdoor work & traffics.

Sex

It was observed that 56.67% patients were male. It is due to involvement in different activities at routine life which exposes them to higher rate of trauma in comparison to female.

Nature of trauma

It was observed that 53.34% of fracture due to direct trauma. This concludes that usually trauma or violence like fall, traffic accidents, hit by hard objects and machinery injury etc. are the causes of fracture.

Occupations

In the present study it was observed that 30% patients were businessmen. It indicates that business men were engaged in driving & strenuous physical activity are more prone to accidents.

Area: It was observed that 76.66% patients were from urban area might be due to they are more prone to road traffic accident & trauma.

Socio-economic status: It was observed that 40% patients were from middle socio-economic status. The possible reason might be their nature of occupation, hard work, and hectic life style.

Deformity: From this present study it was observed that 53.33% patients having visible deformity.

Mobility between fragments: It was observed that 76.67% patients were having mobility between fragments.

Crepitus: It was observed that in 76.67% cases crepitus was present.

Shortening: From this clinical study it was observed that in 56.67% of cases shortening was present.

Bone involvement: The incidence of bone involvement was reported 66.67% in radius.

Bone segment: It was observed that 63.34% of cases were suffering from distal bone fracture.

Fracture pattern: It was observed that 76.67% was transverse fracture.

Displacement: From this present clinical study it was observed that 76.67% fractures were displaced.

Discussion on clinical sign & symptoms: From this study it was shown that 100% of patients having the complain like pain, swelling, tenderness, restricted joint movement & weak grip strength. The 90% of patients complaining deformity & 56.67% of patients complaining shortening.

The aim of this study was to evaluate the effectiveness of manjishthadi lepa in fracture healing. After 6 week of treatment.

Effect on pain

Before treatment, in trial group the Mean ± SD was 1.5 ± 0.51 & decreased to 0.07 ± 0.26 after 6^{th} week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. This effect shows the analgesic property of the drug.

Effect on swelling

Before treatment, in trial group the Mean ± SD was 1.42 ± 0.51 & decreased to 0.07 ± 0.26

after 6th week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. This effect shows the anti-inflammatory action of the drug.

Effect on tenderness

Before treatment, in trial group the Mean ± SD was 2.57 ± 0.51 & decreased to 0.14 ± 0.36 after 6th week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. This effect also shows the analgesic property of the drug.

Effect on joint movement

Before treatment, in trial group the Mean ± SD was 1.5 ± 0.51 & increased to 3.78 ± 0.42 after 6th week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. This assessment shows the drug reduces the joint stiffness proximal or distal to fractured site which was immobilised during treatment.

Effect on grip strength

Before treatment, in trial group the Mean ± SD was 1 ± 0 & increased to 4.14 ± 0.53 after 6th week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. It shows the drug helps in reduction of post fracture complication like weakness of muscles.

Effect on callus formation

Before treatment, in trial group the Mean ± SD was 1 ± 0 & increased to 4.92 ± 0.26 after 6th week of treatment which is highly significant with 'p' value <0.001 i.e. 0.1% level of significance & 13 degree of freedom. This effect shows the drug helps in supplementation of nutrients for fracture healing.

Mode of action

The lepa is a semisolid paste form. The paste while applied on the skin, it starts its physiological action in following manner:

The stratum corneum of the skin being keratinized tissue, behaves as a semipermeable artificial membrane, and drug molecules can penetrate by passive diffusion. The rate of drug movement across this skin layer depends on the drug concentration in the vehicle, its aqueous solubility, and the oil/water partition coefficient between the stratum corneum and the products vehicle. Substances that possess both aqueous and lipid solubility characteristics are

good candidates for diffusion through the stratum corneum. Once through the stratum corneum, drug molecules may then pass through the deeper epidermal tissues and into the dermis. If the drug reaches the vascularized dermal layer, it becomes available for absorption into the general circulation. Whereas drug blood levels achieved by transdermal drug delivery systems may be measured and equated against desired therapeutic effects.

Rubimallin present in manjishtha has the anti-inflammatory action which may helps in reduction in pain, swelling and tenderness at fracture site. The glycyrrhetinic acid in liquorice extract gives anti-inflammatory effect similar to glucocorticoids and mineralocorticoids. Glycyrrhizic acid inhibits all factors responsible for inflammation. It inhibits cyclo-oxygenase activity and prostaglandins formation (specifically prostaglandinE2). Shatadhauta ghrita used as a vehicle for drugs to be applied externally. It is applied in many pittaja ailments associated with burning sensation and pain. The presence of flavonoids and polyphenolic compounds in raktachandan evidenced by preliminary phytochemical screening suggests that these compounds might be responsible for anti-oxidant and anti-inflammatory effects. Rice water is prescribed by the Pharmacopeia of India as an ointment to counter act inflamed surface.

CONCLUSION

Manjisthadi lepa has Vedana-sthapana, Shothahara and Asthi sandhanak properties. Significant result is achieved in the trial group cases of Bhagna managed Manjisthadi lepa.

Advantages of Manjisthadi lepa:

1. It is a low cost effective medicine.
2. It is available in every part of the country.
3. People leaving in remote areas irrespective of urban and rural area can utilize it.
4. The process of preparation is also very easy.
5. It does not require any scientific process.
6. The process of application is easy.
7. This orthopaedic lepa can be used in day to day practice of every practitioner.
8. It can be applied as the outdoor management.

From this clinical study it is proved that Manjisthadi lepa is highly effective in the management of Bhagna. However the present work has been conducted on a limited number of patients within a stipulated time period. Hence further continuous extensive research on more number of cases would provide better result, which would be a great contribution to the orthopaedic field.

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