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Original Research Article

Efficacy of Short Wave Diathermy in Patients with Sinusitis

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ABSTRACT

The objective of the research was to study the effectiveness of S.W.D in management of sinusitis. In Sinusitis there is inflammation of the lining membrane of Para nasal sinuses and has intimate relation to nasal cavities with upper and lower respiratory tract. Sinusitis gives miserable experience to the sufferer in the form of sinus headache, nasal obstruction, and nasal discharge, pain over face and behind the eyes. S.W.D acts very effectively in sinusitis by resolving the inflammation. This is considered as it produces heat in deep parts at the sinus mucosa level and gives effect of dilatation of arterioles and capillaries resulting in an increased flow of blood, supply of oxygen and nutrients and also increases local saturation of antibodies and WBCs at the site of inflammation. This is followed by increased absorption which assists in the removal of waste products which helps in resolution of infection. A study was conducted from January 2010 to December 2010, in the Department of ENT and Department of physiotherapy of Pravara Institute of medical Sciences, Loni, Ahmednagar, Maharashtra, India. As per the referral by ENT surgeon 120 subjects diagnosed as sinusitis, of which 75 subjects were selected and willing to participate in the study. During the study pre and post treatment measurements of symptomatic relief, recurrence of sinusitis and pain rate was measured. Present study was carried out to assess the effectiveness of SWD as an adjuvant treatment and symptomatic relief in patients of Sinusitis. We observed that there were significant differences in Pre and Post treatment session for the resolution of signs, symptoms, and recurrence of sinusitis. Also there was high significant difference in pain reduction ($p<0.01$). Therefore it is suggested that this method can be used in the treatment of sinusitis as a non-invasive and cost effective method with improvement in comfort of patients.

Key words: Short Wave Diathermy, Sinusitis

INTRODUCTION

Sinusitis is the inflammation of the lining membrane of one or more para nasal sinus cavities. It has intimate relation to nasal cavities along with upper and lower respiratory tract. Sinusitis gives miserable experience that is pain over face and /or behind the eyes with difficulty in breathing due to nasal obstruction and nasal discharge. [1, 2] The treatment of acute and chronic sinusitis has taxed the resources of Oto-Rhino Laryngologists for many years. Some of the usual procedures generally works well in few patients, but in the majority of cases, especially where antral lavage is repeated, patients soon develop an aversion to the treatment because of the discomfort arising from the procedure. [3]

Tribute should be paid to the numerous experiments of Haase and Schliephake and others, for their investigation of the effect of short waves on bacteria. They found that short-wave exposure kill bacteria at a lower temperature than does the hot-water bath. This might indicate they believe that there is in addition to the heat effect. [4]

In the last few years short wave diathermy has been developed and improved to the point where it now may be found to fulfill a very necessary and important position in the routine treatment of nasal sinus infection, in that it does give relief and hastens the cure in most of cases without hurting or frightening the patient. Leichner and Schmidt' claim that "It is a more or less well-established fact that shortwave diathermy results in a dilatation of the capillaries which persists for a considerable period of time following treatment due to production of heat. But in addition the increased circulation is the more important factor. It is not necessary to elevate the temperature to such a degree that it will destroy the organisms. [5] The increased amount of local heat, together with the increased circulation and dilatation of the capillaries certainly produces a more definite effect than any other form of treatment. [6]

Short Wave Diathermy acts very effectively on sinusitis by resolution of inflammation as it produces heat deep at the site of inflammation. S.W.D. Machine consists of triode valve, step up and step down transformer and capacitor. All these components help in conversion of electro Magnetic energy with the frequency of 50 cycles /sec to 27.12 M Hz. Thus the electromagnetic waves are produced from alternating current from a patient as a part of circuit when two electrodes are arranged opposite to each other. These Electro Magnetic waves will pass through the body and they will cause oscillation of charged molecules within the body fluid. These molecules means ions and proteins oscillate to and fro motion. This oscillation of charged molecule within the electric field of S.W.D. causes heat. Effect of heat is dilatation of arterioles and capillaries result in an increased flow of blood the area making available an increased supply of oxygen and nutrients and also bring about more antibodies and W. B.Cs. The dilatation of capillaries increases the exudation of fluid in the tissues and this followed by increased absorption and assist in the removal of waste products this effect helps in resolution of infection. [1, 7]

And it also the more advantageous in the form of deep penetration, it goes deep up to 5cms. It can be used while attending another patient simultaneously, which allows you to manage your time in the

clinic. It covers large areas. It can heat the deeper tissue without heating the superficial tissue. It can be used with sensitive tissues because it doesn't need to be in contact with the treated tissue. [8, 9]

Purpose of study:

The advent of short wave Diathermy on the therapeutic horizon in the past ten years has brought forth exorbitant claims regarding its efficacy. These have encouraged its indiscriminate use by the medical profession, often on the insistence of the patient. Sinusitis can be prevented by regular intake of fluids, a balanced diet and exercise. To prevent sinusitis, it is advised that activities like smoking or being exposed to passive smoking can be avoided as much as possible. There is also a variety of alternative kinds of treatment for sinusitis like saline solutions, homeopathy, acupuncture and various herbs. Barberry and eucalyptus are popular and effective herbs because they have active substances like alkaloids and strong anti-bacterial properties that fight infection. Also the traditional therapy like antibiotics and other medicinal agents like decongestants etc.

Our purpose in this study is to demonstrate the indications and advantages for this increasingly popular form of physical therapy that is Short Wave Diathermy in intranasal disease by statistical analysis.

AIMS AND OBJECTIVES:

To assess the effectiveness of SWD:

1. As a single mode of treatment in Sinusitis
2. As an adjuvant mode of treatment in sinusitis
3. For symptomatic relief of pain, headache and nasal obstruction in sinusitis

CASE SELECTION CRITERIA:

Inclusion Criteria:

- Both male and female patients with acute and chronic sinusitis
- Age group of 18 to 60 years.
- Those who were willing to participate in the study.

Exclusion Criteria:

- Diabetes, Hypertension, Pregnant women.
- Tuberculosis, heart disease, and malignant growths.
- Low Blood pressure, Dizziness.

MATERIAL AND METHODS

Study design: Prospective comparative cross sectional study

Study Period: The study was carried out during January 2010 to December 2010.

Study settings: Department of ENT and Department of physiotherapy, Pravara Institute of medical Sciences, Loni, Tal. Rahata , Ahmednagar, State - Maharashtra, India

Population for study: As per the referral by ENT surgeon 120 subjects diagnosed as acute or chronic sinusitis. Out of these 120 subjects 75 subjects were willing to participate in the study.

Study tool: A structured interview schedule was prepared comprising of clinical examination and health check-up and routine investigations.

The Ethical committee of the institute approved the study. Informed consent of each subject was taken. And all subjects were divided randomly in three groups.

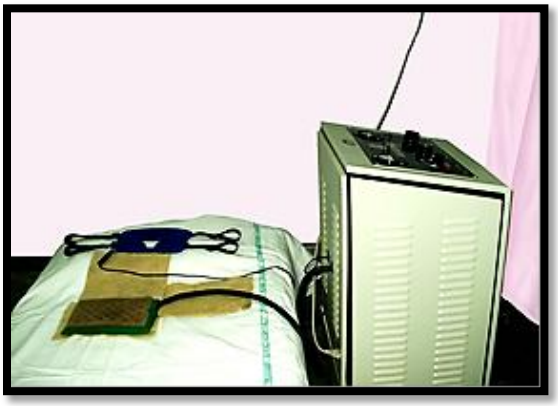
Study was carried out in 75 cases diagnosed as sinusitis:

Group A: 25 subjects treated with SWD treatment.

Group B: 25 subjects treated with SWD and routine medical treatment.

Group C: 25 subjects treated with only routine medical treatment.

Procedure: All subjects were re-evaluated in the physiotherapy department. Procedure of SWD explained to the subjects followed by a written consent. During S.W.D. treatment subject was made comfortable in lie down supine position on bed. The butterfly electrode is placed on face, with the second electrode on cervical / dorsal spine. With all precautions the treatment duration and intensity has been set to required level. Treatment generally lasts for fifteen to twenty minutes. Some writers suggest starting in at ten minutes and working up to about half an hour. In our own setup we find that duration of fifteen to twenty minutes is sufficient. As a rule six to eight sittings of treatment will generally clear up the average acute maxillary or frontal sinusitis, with a maximum of about twelve sittings of treatments. A thick piece of towelling is placed between the face and the electrode. This tends to absorb any moisture which may accumulate due to perspiration. Perspiration must be carefully watched, as it acts as a condenser plate and the subject is apt to get a burn. Records were maintained for all subjects.



Patient receiving SWD

RESULTS

Table No.1: Resolution of Signs: nasal discharge, sinus tenderness, Nasal congestion.

	Day 1 No. (%)	Day 2 No. (%)	Day 3 No. (%)	Day 5 No. (%)	No Effect No. (%)
Gr A n=25	06 (24%)	4 (16%)	04 (16%)	10 (40%)	01(4%)
Gr B n=25	09 (36%)	08 (32%)	08 (32%)	12 (48%)	01 (4%)
Gr C n=25	02 (8%)	03 (12%)	07 (28%)	11(44%)	02 (8%)

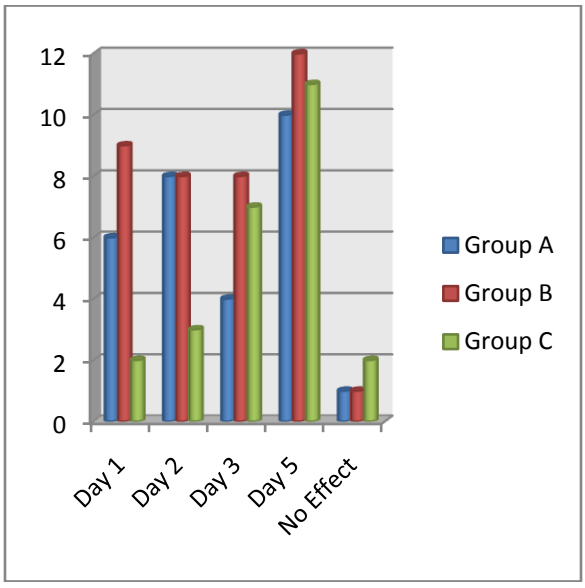


Table No.2: Resolution of Symptoms: Nasal discharge, Head ache, Fever, nasal obstruction.

Groups	Immediate	6 Hrs	12 Hrs	24 Hrs	No Effect
Gr A n=25	19(56%)	02(8%)	01(4%)	00	03(12%)
Gr B n=25	19(56%)	13(52%)	04 (16%)	00	02 (8%)
Gr C n=25	02 (8 %)	02(8%)	02(8%)	04 (16%)	04 (16%)

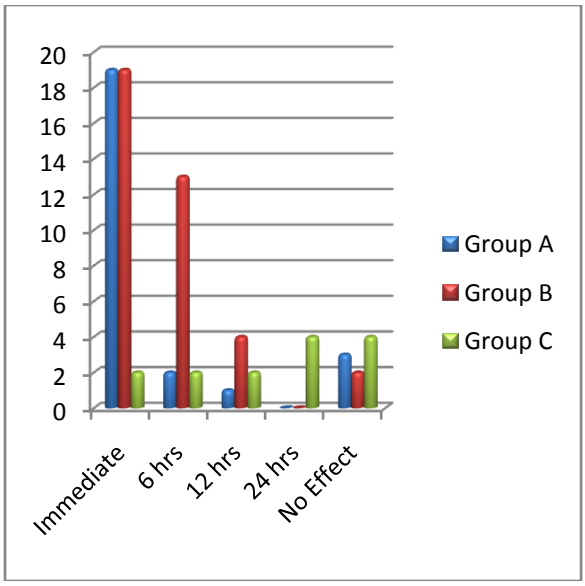


Table No.3: Recurrence of Sinusitis:

Groups	2 Months	3 Months	4 Months	6 Months
Gr A, n=25	00	00	00	08 (32%)
Gr B, n=25	00	00	00	01(04%)
Gr C, n=25	00	06(24%)	03(12%)	07(28%)

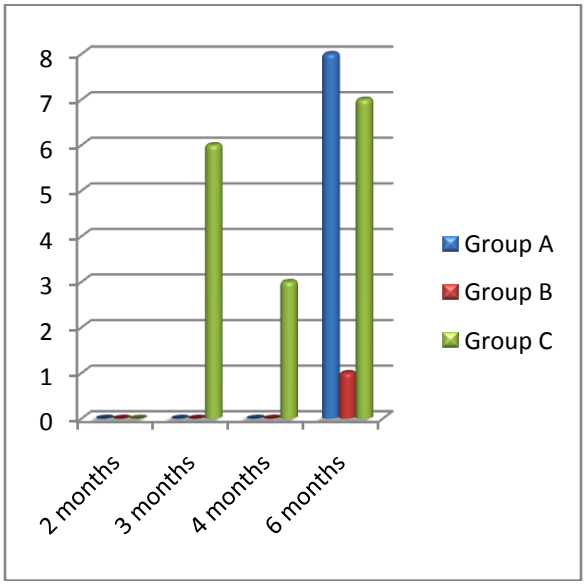
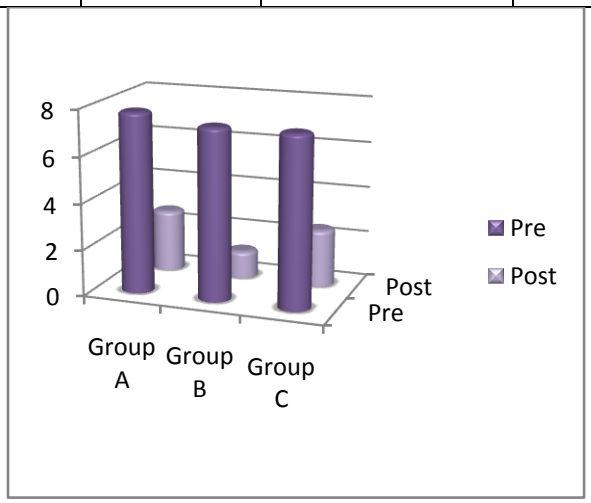


Table No.4: Reduction of Pain (Visual Analogue Scale)

	Group A	Group B	Group C
	n=25	n=25	n=25
Pre	7.8±1.327	7.4±1.327	7.4±1.327
Post	2.7±2.213	1.2±2.213	2.5±0.000
t	24.87	34.83	2.768
P" value	p<0.05	p<0.01	p<0.05
Significance	Significant	Highly significant	Significant



DISCUSSION

This study shows that Short-wave diathermy is an amazingly effective treatment for the sinusitis when it is skill fully administered. Although the treatment, which is based on the application of heat to the affected parts and operates somewhat like a radio transmitter. It has produced remarkable results when given by specialists. The advent of short wave therapy on the therapeutic horizon in the past ten years has brought forth exorbitant claims regarding its efficacy. These have encouraged its indiscriminate use by the medical profession, often on the insistence of the patient. [1, 3] Sub-acute and chronic sinusitis responded with SWD. It can help in resolving the signs and symptoms as well as the inflammatory state. These reduce swelling and promote vasodilatation .There are very few studies investigated about S.W.D and sinusitis .So we tried our best and this is our more innovative study with good results.

We compared our results with other studies on diathermy. P. E. Paterson, M. D. Ottawa treated a series of 126 acute and sub-acute cases for sinus conditions over a period of three years. They found that 96 cases were improved and quite enthusiastic about the treatment; 22 were questionable as to results and 8 definitely had no improvement or were worse. Since the use of short wave diathermy in their own practice they have noticed that not a single patient required antral lavage as a part of treatment which in fraction of the cases they did formerly.

Table No.1 Shows on first day Group A shows resolution of signs in 06 (24%) subjects. Group B - 09 (36%), Group C - 02 (8%). But on fifth day Group A- 10 (40%) Group B 12 (48%) Group C - 11(44%) showed resolution of signs which is much better. P. E. Paterson, M. D. Ottawa found that patients improved with great effect on pain, along with resolution of signs and symptoms with little recurrence of the sinusitis and as a result the patients were not so hesitant about returning for further treatment. Also economically, they found that patients cleared up from their condition much more early than previous forms of treatment by saving additional expenditure. [1, 9] According to our study we also found the same results in resolution of signs and symptoms. Our study shows more percentage of better results in all the groups. There are very few subjects who reported recurrence of sinusitis in Group A and Group C. But in Group B there is very little recurrence of sinusitis that is only in 1 subject (0.04%) Shown in table No.3

Table No.4 shows reduction in pain that is measured by standard and valid measure is Visual analogue scale. We observed Pre and post measurement in three groups We found that in Group A Pre 7.8 ± 1.328 while post 2.7 ± 2.213(P< 0.05) Significant .Group B- Pre 7.4 ±1.327and post 1.2 ±2.213 (P< 0.01) Highly Significant .Group C, Pre 7.4± 1.327, and post 2.5± 0.000(P< 0.05) Significant. Our results correlate with Geoffrey C. Goats, The Queen's College, Glasgow.

The previously mentioned studies were more of comparison between different methods for treating sinusitis. There are only few studies that investigated the effect of SWD in sinusitis and very little written about combination of the treatment. It is a more or less well-established fact that short wave diathermy results in a dilatation of the capillaries which persists for a considerable period of time following treatment. But in addition the increased circulation is the more important factor. It is not necessary to elevate a temperature to such a degree that it will destroy the organisms. There is no question that we are able to produce a greater effect on the blood circulation by means of short wave diathermy than we have been able to do in the past. The increased amount of local heat, together with the increased circulation and dilatation of the capillaries certainly produces a more definite effect than any other form of treatment. [6, 10] The recently used butterfly electrodes are more effective in treating the sinus disease. The lines of forces pass through the tissues and causes heating of the structures. Ciliary action is increased which ultimately leads to decrease in the congestion. Relief of the congestion helps in relieving the pressure inside the sinus, which finally result in relief from pain. [14, 18]

CONCLUSION

With the presented quantitative findings for the relief of signs and symptoms also the reduction of pain we can state that there was almost same effect for the treatment of sinusitis with only either routine medical treatment or SWD. But when it is applied with combination of both i.e. routine medical treatment and SWD gives more benefit and earlier effect with little or no recurrence of the sinusitis

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