

Original Research Article

Demographic profile of ear nose throat and head neck patients undergoing shortwave diathermy in a tertiary care centre of Punjab: a five-year study

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ABSTRACT

Background: Short wave diathermy is a panacea in many otorhinolaryngology and head neck pathologies where either conservative therapeutic modality or surgical intervention has been undertaken. The profile of subjects who underwent short wave diathermy in a period of 5 year is discussed.

Materials and Methods: 490 subjects undergoing short wave diathermy in the otorhinolaryngology and physiotherapy services of a tertiary care centre of Punjab were analyzed during a period of five years. The subjects were studied for their demographic profile.

Results: Maximum patients 42.24% (207 patients) who underwent shortwave diathermy were in the middle age group (21-60 years). Females 62.04% (304 patients) outnumbered the males 37.95% (186 patients). Maximum sittings of male patients were 54 (13.91%) and for females were 47 (12.11%) during the period 2015-2016.

Conclusion: Short wave diathermy is an effective pain therapy for inflammations of ear, nose neck and the maxillofacial region.

Keywords: Shortwave diathermy, Oto-rhino-laryngology, Head neck, Age, Gender

INTRODUCTION

Pain information begins at naked nerve endings called nociceptors forming a functional pain unit with nearby tissue capillaries and mast cells. Tissue injury causes these nerve terminals to depolarize, an event that is propagated along the entire afferent fiber eventuating in sensory impulses reaching the spinal cord. This firing of primary afferent fibers at the site of tissue injury causes axonal release of vesicles containing neuropeptides such as substance P, which acts in an autocrine and paracrine manner to sensitize the nociceptor and increase its rate of firing. Cellular damage and inflammation increase concentrations of other chemical mediators such as histamine, bradykinin, and prostaglandins in the area surrounding functional pain units. These additional

mediators act synergistically to augment the transmission of nociceptive impulses along sensory afferent fibers.¹

The use of heat to expedite healing and relieve the pain goes back to the Egyptian era where they used to apply hot stones for joint pain. standard applications of heat from hot towels, heating pads, whirlpools, ultrasound are in practice by health care professionals for deep tissue pain to increase the blood circulation.

Deep-heating agents, also called diathermies, include ultrasound, shortwave, and microwave. Therapeutic ultrasound is a method of stimulating the tissue beneath the skin's surface using very high-frequency sound waves. Shortwave and microwave diathermy use high-frequency electromagnetic energy to generate heat.²

Shortwave diathermy is a non-ionizing radiation from the radio frequency portion of the electromagnetic spectrum. Reference to the medical use of high-frequency electrical current, dates back to 1890s, when d'Arsonval passed a 1 ampere current at high frequency through himself and his assistant.³

The efficacy of diathermy is related to the increase in heat in the deep tissue. The effect includes an increase in vasodilatation and soft tissue elasticity, amelioration of local blood flow, and reduction of muscle spasms.⁴

Vasodilation leading to increase in blood flow washes out the nociceptive materials thus reducing pain and increased blood flow helps in healing of the damaged tissues resulting in reduction in inflammation and in relieving spasm. Heat kills the gram-positive organisms like streptococci, pneumococci, etc. producing symptomatic relief.⁵

Shortwave diathermy is the clinical application of electromagnetic energy to the body at a fixed radio frequency of 27.12 MHz with power of 44 watts for 20 minutes producing vibration of the particles resulting in frictional heat having penetration depth of 3 to 5 cm and temperature rise of 4 degree Celsius.⁶

Diathermy is useful in conditions such as: arthritis, bursitis, tenosynovitis, fibrositis, myositis, sprains, strains, fractures, neuritis, peripheral vascular disease, pneumonia, bronchitis, otitis media, pelvic inflammatory disease, chronic wounds, lymphedema, chronic fatigue syndrome, fibromyalgia, postsurgical pain and edema.⁷

Diathermy is contraindicated over metal (implants, surgical staples, etc), on patients with implanted electronic devices, on metal treatment tables, over the eye and the epiphyseal areas (bone growth centers) of the bones of growing children.⁷

Aim

To study the demographic profile of ear nose throat and head neck subjects undergoing shortwave diathermy.

METHODS

490 subjects undergoing short wave diathermy in the otorhinolaryngology and physiotherapy services of a tertiary care centre in north Indian state of Punjab were analyzed. The study period was from Jan 2015-Dec 2019, i.e 5 years. The size and gender of the patients was recorded from the records. The retrospective study included analysis of the age, gender and frequency of sittings of subjects undergoing short wave diathermy.

Inclusion Criteria

The inclusion criteria were as follows: otitis externa, benign necrotizing otitis externa, pre and post-surgical

interventions in entities, Ludwig's angina and cervical abscesses.

Exclusion criteria

The exclusion criteria were as follows: malignancies of ENT and head neck region, post radiotherapy patients and pregnant ladies.

Statistical analysis

All statistical calculations were done using Statistical Package of Social Sciences (SPSS) 17 version statistical program for Microsoft windows (SPSS Inc. released 2008. SPSS statistic for windows, version 17.0, Chicago). Ethical approval of the study was taken from the Institutional Ethics Committee.

RESULTS

Table 1: Age distribution of patients undergoing shortwave diathermy.

Age group	No. of patients (n=490)	Percentage
<14	100	20.40
14-20	95	19.38
21-60	207	42.24
>60	88	17.95

n= total number of patients

Maximum patients 42.24% (207 patients) underwent shortwave diathermy were in the middle age group (21-60 years) and minimum 17.95% (88 patients) were above 60 years of age. Females 62.04% (304 patients) outnumbered the males 37.95% (186 patients) who underwent shortwave diathermy.

Table 2: Gender distribution of patients undergoing shortwave diathermy.

Gender	Number of cases (n=490)	Percentage
Male	186	37.95
Female	304	62.04

n= total number of patients

Females outnumbered the males in all age groups except the 60 years and above age group. In the age group 21-60 years, there were maximum females 75.84% (157 patients) where the male patients were significantly less i.e., 24.15% (50 patients). The record of 2 years i.e., the period. 2015-2016 was analyzed, 155 patients had undergone shortwave diathermy in the ENT head neck region. The total number of sittings were 388. The maximum number of sittings undergone were 14 by a single male and 15 by a female patient. Single sitting was noted in 101 (26.03%) subjects of which there were 54 males and 47 females.

Table 3: Gender distribution with respect to age groups of patients undergoing diathermy.

Gender	Age groups (in years)			
	<14	14-20	21-60	>60
Males	43	45	50	48
Females	57	50	157	40

Table 4: Correlation frequency of sittings for short wave diathermy (during the 2-year period 2015-2016).

Gender	Number of sittings														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Males	54	5	3	2	2	2	2	2	0	1	1	1	0	1	0
Females	47	7	5	5	4	3	3	2	1	0	0	0	1	0	1
Total	101	12	8	7	6	5	5	4	1	1	1	1	1	1	1

n= total number of patients; n'= total number of sittings

DISCUSSION

Inflammations of the ear, nasal cavity and the maxillofacial region, especially in diseases of the roots of the teeth are successfully treated with short wave diathermy to provide symptomatic relief. Short wave diathermy is used for otitis externa, middle ear infections, post incision and drainage masseteric space abscess, healing of extraction sockets, temporomandibular joint disorders in otorhinolaryngology head and neck surgery to relieve pain and induce anti-inflammatory effect.⁸

490 patients underwent short wave diathermy over a period of 5 years (January 2015 to December 2019). In our study maximum patients 42.24% (207 patients) who underwent shortwave diathermy were in the middle age group (21-60 years) and minimum 17.95% (88 patients) were above 60 years of age.

Shortwave diathermy reduced the dose and duration of adjuvant analgesic medications in subjects of malignant otitis externa and cellulitis of cervicofacial region. Thereby the nephrotoxicity or hepatotoxicity of the same.

This is comparable to the study done by Kalerkar S et al where mean age of patients was 22.65 ± 1.85 years and female patients outnumbered the male.⁹

30 subjects between 18-50 years of age were analyzed for the effect of short-wave diathermy in the study by Anand B Heggannavar et al with female preponderance.⁴

In our study too females 62.04% (304 patients) outnumbered the males 37.95% (186 patients) who underwent shortwave diathermy. Females outnumbered the males in all age groups except the 60 years and above age group.

The study done by Paterson, on the treatment of nasal sinus infection by ultra-shortwave diathermy among 126 cases interpreted that shortwave diathermy has bactericidal effect on streptococci thus resulting in increased phagocytosis.¹⁰

CONCLUSION

490 patients underwent diathermy over a period of 5 years from January 2015 to December 2019. Females outnumbered the male. The maximum patients were in middle age group.

Short wave diathermy is an effective pain therapy, adjuvant or alone, for inflammations of ear, nose neck and the maxillofacial region, thereby reducing the duration and dosage of intravenous or oral analgesics.

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