

The Role of Pulsed Radiofrequency for Greater and Lesser Occipital Nerves in the Treatment for Migraine

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INTRODUCTION

The International Association defines pain for the Study of Pain (IASP) as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (international association 2017). Migraine is illness have features of repeated acute to moderate headaches (Ahmed 2012). The features of this headache is throbbing, remain from hours to three days (Ahmed 2012). Related symptoms with headache consist of nausea, vomiting and light sensitivity, and sound and smell hyperactive response (Scadding et. al 2011). The pain increase during physical movement (Olsen et al, 2011). More than 1/3 of persons get an aura: a little dated of optical trouble that signals that the headache will rapidly happen (Olsen et. al, 2011). Sometimes, an aura present without or with some headache (Poser et. al, 1995). Migraines is occur due to association of ecological and hereditary reasons (Piane et al, 2007). 2/3 of patients with migraine occur between families (Bartleson et al.2010). It may be occur due to fluctuation of hormonal level, so the migraine marginally occur in male more than female before puberty and 2-3 times after puberty (Brands 2012). In addition, the danger of it become low through pregnancy (Brands 2012) with unknown original causes (Whigham et al, 2018). Radiofrequency (RF) is define, as electrical signs pass to neural tissue so RF rods introduced into the tissue is usual to managing the pain (Cosman et al, 2005). In addition, other illnesses such as fibrillation of atrium (Hunter et al, 2015). (Cosman et al. 1998) describe the initial RF lesion producers and rods in the primary 1950s, constant wave RF 0.1-1 mHz rate and so mentioned as constant RF lessening.

ABSTRACT

Background: Migraine pain is a primary headache disorder characterized by recurrent headaches that are moderate to severe.

Objective: To evaluate the effect of noninvasive pulsed radio frequency (pulsed RF) in Migraine.

Methods: In a prospective study of the intervention performed in adult population with Migraine (Diagnosed by specialists) carried on (30) patients undergone pulsed RF for greater and lesser occipital nerves to control recurrent migraine not responding to conventional treatment (resistant) in a period from Jan. 2017 to Jan 2019 in Al Safeer Hospital for surgical specialties and Alkafeel Hospital for surgical specialties both in Karbala / Iraq. The patients got in prone position under local anesthesia with goal positions with the target sites obvious out using anatomical breakthroughs and the position of greatest ache. Pulsed RF by RF needle to the affected side to reach greater and lesser occipital nerves then got 3 sessions (each for 3 minutes, temperature 42 C, voltage 42 V, resistance with 100 Ohms, Current with 230 mA) Patients monitored post-operatively for 2 hours then discharged. Follow up at intervals of 30 days, 6 months and 1 year by phone call or direct interview to assess the post procedure pain scale.

Result: Significant pain relieve by means of no or little pain medication and actual life pattern change and performance in 1-year post procedure.

Conclusion: A single trial of pulsed RF is effective for pain reliever.

Keywords: Migraine, greater and lesser occipital nerves, pulsed RF, pain.

Newly, additional RF technique describe for pain therapy, tiny beats of RF signals are useful to the neural tissue over the RF rod, this called throbbled RF lessening (Sluijter et al, 1998). The signals period durations fluctuating from 10 - 30 ms, the recurrence rates fluctuating from 1 - 8 Hz (beats /second) (Cosman et al, 2005). Prompt of serotonergic in addition to noradrenergic scheme and stimulation of descendant paths (Sluijter et al, 1998 and Deniz et al, 2015)). More regulation of abrupt initial gene c-fos that responsible of immune response inside laminae 1 beside 2 of horn dorsally (Atim et al. 2011). Triggering spread element 3, this initial gene that stated in reaction to cell pressure with a tendency-depressed directive of CGRP appearance (Hamann et al. 2006).

METHODS

This is a prospective observational study of pre/ post-intervention performed in adult population with Migraine (Diagnosed by specialists), carried on (30) patients (23-45) years of age, with resistance migraine (not responding to all medications) undergone pulsed RF (single session) for greater and lesser occipital nerves to control recurrent migraine attacks not responding to conventional treatment (resistant) in a period from Jan. 2017 to Jan 2019 in Al Safeer Hospital for surgical specialties and Alkafeel Hospital for surgical specialties both in Karbala / Iraq. Patients with history of chronic pain, opioid ingestion, those who get chronic medical and psychological illnesses, any contraindications to procedure or drugs used, smoking, alcohol drinking and pregnancy were excluded. The patients got in prone position, under local anesthesia by the mark

locations noticeable using anatomical standards and the places of greatest inflammation. Pulsed RF by RF. Needle to the affected side to reach greater and lesser occipital nerves then got 3 sessions (each for 3 minutes, temperature 42 C, voltage 42 V, resistance with 100 Ohms, Current with 230 mA) for one trial lasting 15 min. – 20 min. Demographic data of patients (age, gender, residency – urban/rural, marital status, family history, occupation and duration of disease) had been recorded in already prepared data collecting sheets. The same standardized technique for the 30 patients selected. Each patient putted on prone position with head full rotation to the affected site for better approach and visualization. Optimum beginning point for directing the nerves was originate to be ¼ to 1/3 of the space lengthways a line linking the outside occipital bulge to the process of mastoid (3 to 5 cm) and in a minor depression medial to artery at the higher nuchal edge. A subcutaneous skin swelling elevated by 1% lidocaine besides a needle of 25-gauge. A needle of gauge 20 with tip 10 mm put inside as marginally sloping angle (20-45°) to the expected zone of neural tissue. Stimulus of electrical done to provoke symptoms of concordant in the spreading of nerve of occiputs. This talented by recurrent sensory stimulus at altered places. When greatest stimulus got, the edge recognized by incrementally decreasing the power until sensitivity vanished. Afterward acceptable needle location was definite, PRF was began with an RF producer by the subsequent factors: 40–60 V power production; 2 Hz; 20 beats in 1 sec. another factors was 180 beats per second; 150 - 500 W; under 42 C°. Then at the end of the procedure,

mixture of dexamethasone (12 mg) +Lidocaine (20 mg) given at the procedure site, then needle withdrawn at end of the whole procedure with bandaging covers, monitoring of all patients done during procedure by means of SPO2, NIPB, pulse rate, ECG then for 2 hours post procedure then discharged. Postoperatively all patients received the same treatment of baclofen, Vit B12 for 1 month, the patients assessed at regular intervals of 30 days, 6 months and 1 year. Pain was estimated according to the Numerical Analogue Scale (NAS): 0 =no pain; (1-3) =mild, (4-7) =moderate, (8-10) =severe, and 10=extremely severe pain. No any drugs deviations or other interferences doing during the technique and the primary and after 30 days, we do follow up and continue for one year. Pain marks 0-10 as a scale. ≥ 50% this refer to positive results and pain stop after 1 months post therapy. Patients satisfaction assessed by questionnaire that prepare to evaluated the advantage for myself or by phone. The follow up of patients done by phone or patients visits. Results recorded in data collecting sheet. The difference considered statistically significant if the P value was less than 0.05.

RESULTS

In this study, (30) patients treated by interventional pulsed radio frequency under local anesthetic for their migraine resistant attacks. The age distribution of patients with migraine in Al Safeer Teaching Hospital and Alkafeel Hospital for surgical specialties in Karbala governorate in Iraq. The mean age of the patients was 33.03 ± 6.64 year. Most patients were between 30 and 39 year of age figure (1).

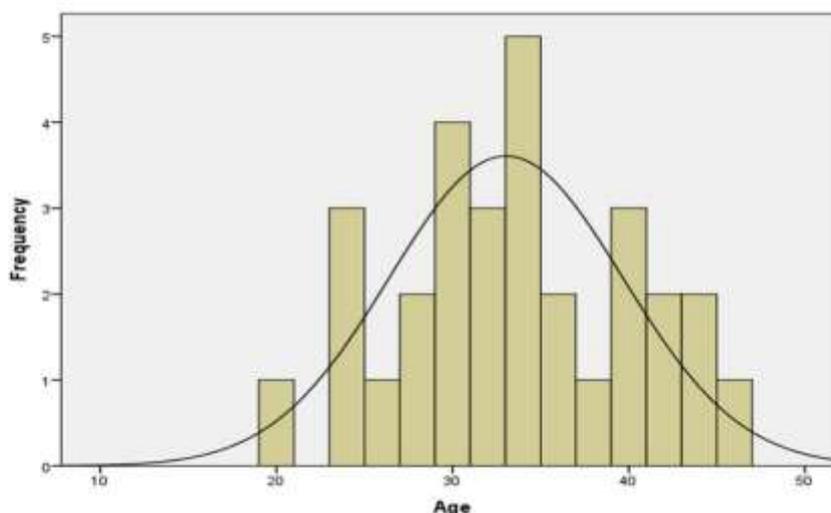


Figure 1: The age distribution

The gender distribution of patients with migraine in Al Safeer Teaching Hospital and Alkafeel Hospital for surgical specialties in Karbala governorate in Iraq. Females formed more than three quarters (80%) of the sample figure (2).

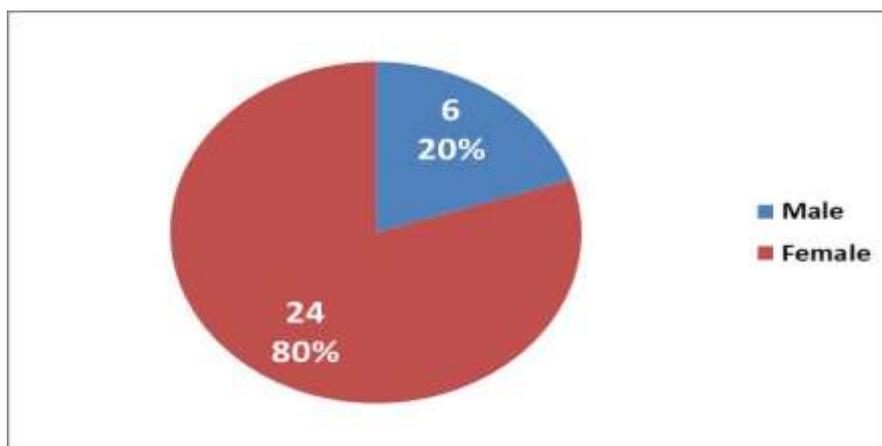


Figure 2: Gender distribution

The demographic characteristics of migraine patients in Al Safer Teaching Hospital and Alkafeel Hospital for surgical specialties in Karbala governorate in Iraq table (1).

Table 1: Demographic characteristics of migraine patients

Variable	Group	Frequency	Percentage
Gender	Male	6	20
	Female	24	80
Age group	Below 30	10	33.3
	30-39 year	13	43.3
	40-49 year	7	23.3
Residency	Rural	6	20.0
	Urban	24	80.0
Marital state	Single	5	16.7
	Married	21	70.0
	Divorced	2	6.6
	Widow	2	6.7
Family history of migraine	Positive	10	33.3
	Negative	20	66.7
Duration of disease	1-4 year	10	33.3
	5-9 year	14	46.6
	>10 year	13	43.3
Occupation	Housewife	19	63.3
	Student	3	10.0
	Employer	2	6.7
	Worker	2	6.7
	Accountant	1	3.3
	Business	1	3.3
	Engineer	1	3.3
	Teacher	1	3.3
	Total	30	100.0

The distribution of history of aura among of patients with migraine in patients in Al Safer Teaching Hospital and Alkafeel Hospital for surgical specialties in Karbala governorate in Iraq. About two thirds of patients (60%) reported to have aura phase before the attack of migraine (Figure 3).

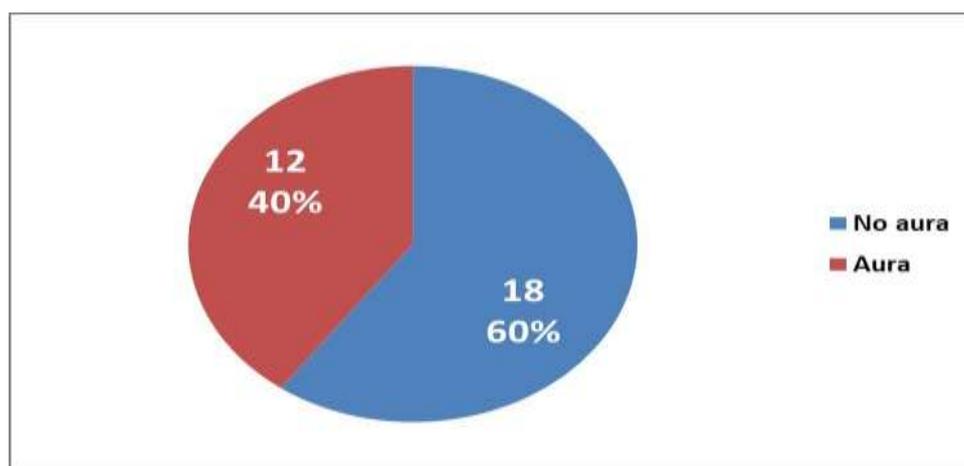


Figure 3: Aura distribution

The Pain score distribution of migraine patients in Al Saefer Teaching Hospital and Alkafeel Hospital for surgical specialties in Karbala governorate in Iraq after 1, 6 and 12 months respectively after intervention table (2).

Table 2: The Pain score distribution

Time	Index	Pain score					
		1	2	3	4	5	6
After one month	frequency	16	8	3	1	2	0
	%	53.3	26.7	10.0	3.3	6.7	0
After one month	frequency	16	12	0	0	2	0
	%	53.3	40.0	0	0	6.7	0
After one month	frequency	22	6	0	0	1	1
	%	73.3	20.0	0	0	3.3	3.3

DISCUSSION

Generally greatest no. of patients include in this study have positive consequence. Even some as inaccurate may view this success rate; the results must be revise in patients during conservative treatment due to increase failure rate of treatment. RF for nerve of occipital for therapy of neuralgia of occipital, migraine headache and cariogenic headache, bigger occipital nerve (C2), minor occipital nerve (C3) are the goal of our procedure (Gauci 2004). The association between inferior block capacities also the achievement degree is likely connected to high analytic specificity plus is like to revisions assessing other investigative blocks of nerve (Anderberg et al.2010). Additional sessions of PRF related to good results done in some study those better anti allodynic properties with high PRF period (Tanaka et al. 2010 and Ozsoyar et al. 2008). False connection between extent frontal to the top and technical achievement can possibly credited to the information that the forward part of the scalp found external of the anatomical spreading of the occipital nerves and proposes associated pathology as well “clean”, as patients with migraine headache (Shai et al. 2011 and Hoppenfeld 2010). Therapy of GON is good results when compare it with LON; and the factors determine successful rate include: high changes in the place of LON and the opposite connotation between illness load and management consequence originate for headache besides other pain circumstances cured with radiofrequency sessions (Ducic et al. 2009 and Gendolla et al. 2008). Maybe, the minimum

shocking discovery is that topics with uncertain minor increase subjects knowledgeable lesser consequences than persons empty of any aware or unconscious economic inducements not to become well. This connotation has before experiential for other pain circumstances (Rolling et al. 1995 and Tait et al. 1990) Numerous boundaries in current study, one of important limitation is no similar study and there is no study for comparison between case and control patients, and used placebo for control study using these advanced choice and management factors to overawed these boundaries. Recurrence PRF cycles occur after minor needle use, advanced achievement degree stopped from the real improved period of electrical ground contact, due to needle handling improved the probability of taking the goal nerve (s) inside electrical zone, or mixture, so cannot predicted it. Additional errors consist of absence of normalization of technical method and absence of extended period follow-up. Completely three studies showed that PRF for occipital neuralgia become available international: South Korea, United States and Belgium (Vaneldereren et al. 2010 and Navani et al. 2006). Analytic block procedures varied between the case article and scientific revisions. Difference prominent for blocks done, the kind of sedating used the enclosure of corticosteroid, the volume penetrated, and the exact nerves obstructed. Agreement standard of at minimum 50% pain release believed optimistic diagnostic block, even though a slight collection of 10 patients taking fewer than 50% perfection were involved in the Huang et al revision (Huang et al.

2012). PRF management period fluctuated from 120 m sec - 240 m sec, whereas PRF management cycles fluctuated 1 – 3 / nerve.

CONCLUSION

In summary, the results demonstrate that PRF may provide significant intermediate-term pain relief to a good percentage of patients. Selecting appropriate candidates based on clinical characteristics (i.e., pain pattern limited to the distribution of the occipital nerves), and optimizing diagnostic accuracy (i.e., maximizing the specificity of the disease) and treatment considerations (i.e., utilizing >1 session of PRF) may further improve success rates. Future research should seek to confirm the efficacy of PRF for migraine by conducting placebo-controlled studies utilizing these refined selection and treatment parameters.

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