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Editorial

Warm Greetings and A Very Happy 2019 to all our readers

Dear Friends

It is always a delight to pen down the Editorial of a journal. The April 2019 issue is the second issue of the journal and has equal number of articles as the first issue. It was a great pleasure to see the tremendous response to the first issue of the online journal of our prestigious Swami Vivekanand Subharti University “**Subharti Journal of Interdisciplinary Research**”. I sincerely hope that the effervescence exuded by the first issue continues to linger on in the minds of all our readers and you continue to shower the blessings to the editorial team with enthusiasm.

“If you want to go fast, go alone. If you want to go far, go together”.

This dictum is apt at this juncture where both the Medical and the Non Medical group have joined hands and contributed articles with equal zeal to the first issue and got support from all quarters. It was never easy. But then “If the challenges don’t scare us then probably they are not worthwhile”. We sincerely thank all the contributors of the first issue and would like to again emphasize to contribute to the future issues of the journal. We at the editorial team are striving hard to take the journal to greater heights and it is not possible without wholehearted support from all of you. The editorial team is already in the process of getting the journal indexed with Baidu Scholar, CNKI (China National Knowledge Infrastructure), Google Scholar, SCOPUS etc.

By the time the next issue comes out in August 2019, our nation of 1.3 billion people is going to witness the largest festival of Democracy i.e. the General Elections. Act responsibly and please cast your vote to enjoy the healthy democratic lifestyle. It is upon us to create a happier and healthier nation so please contribute to the nation building by casting your vote..

I would like to say an advance Thank you to all those who have contributed to the second issue of this journal.

We look forward to welcoming your submissions for next issue and your valuable suggestions are eagerly awaited .

Happy Reading and Please Exercise your right to VOTE,

Dr Vijay Wadhwan

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Original Study

Effect of Pressure Biofeedback on Conventional Physiotherapy to maintain Balance in Cervical Spondylosis Patient

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Abstract

Background and Aims-The purpose of the study was to find the effectiveness of pressure biofeedback to utilise isometric training for neck musculature to maintain balance in cervical spondylosis patient. **Study design**- Randomized control trial **Method**- 30 subjects were divided equally into two groups each containing 15 subjects of both gender. Group A (Experimental group) was given isometric strengthening exercise with the help of pressure biofeedback to reduce postural sway. Group B (Control group) was given isometric strengthening exercise without pressure biofeedback. Four parameters were taken to evaluate each subject on day one and last day of 4th week to know the effectiveness of treatment. The parameters were:- Neumaric Pain Rating Scale (NPRS), Neck Disability Index (NDI), Modified Clinical Test for Sensory Integration in Balance (MCTSIB), and Pressure Biofeedback. **Statistical analysis**- The pre & post measurements in both groups were compared using paired 't' test and performance of both groups was compared using independent 't' test. **Result**- The result shows paired 't' test was highly significant i.e. $P < 0.05$ where as independent 't' test showed no significant difference in treatment i.e. $P > 0.05$. **Conclusion**- Hence the study concluded that there was a reduction in postural sway after utilising isometric neck strengthening exercise but there was no significant efficacy of using pressure biofeedback on conventional physiotherapy.

Key words – Cervical Spondylosis, NPRS scale, NDI scale, Modifide CTSIB scale for postural sway, Isometric neck strengthening exercise, Pressure biofeedback..

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Introduction

Cervical spondylosis is a disease caused by stress and strain lead to pain, muscle spasm, restriction of joint motion and alteration of proprioceptive sensation from the joint capsule and neck musculature. Both the gender are affected equally^[1]. The findings in autopsies of 4253 spines clearly show the evidence of cervical spondylosis in 60% of women and 80% of men by the age of 49 years. Most studies have reported significant structural changes in patients with the age of 32 to 35 years^[2].

It has seen that changes in cervical proprioceptor affect the postural control in patient with neck pain lead to postural instability. As a result greater muscle fatigue experience in neck extensor than neck flexor muscle which inturn affect the balance in standing and lead to increase postural sway^[3].

The limit of stability is defined as the amount of postural sway at which balance is lost and corrective action is required. Maintaining balance requires coordination of input from multiple sensory system

including vestibular, somatosensory and visual system^[4]. Guyton (1991) stated that, by far, the most important proprioceptive information needed for maintenance of equilibrium is derived from motor skill of neck. In this regard Clinical Test of Sensory Integration in Balance (CTSIB) is an inexpensive, easily administered test which provide information about ability to stand upright under several sensory conditions^[5]. Helen, Cathleen et al (1993) have used the test in asymptomatic adults and found that it is a useful screening tool for examining static standing balance. Wrisley and Whitney (2004) used modified version of CTSIB on vestibular dysfunction patients to know the foot position while performing the test^{[6][7]}.

It was shown that isometric neck exercise training programme effectively improve the muscle strength in neck musculature. Various information till date are available on postural effect of neck extension exercise. Chiu et al (2005) studied the efficacy of exercise on 145 patients allocated into two groups. The patients allocated in second group got much benefit from neck exercise programme with significant improvement in disability and pain^[8]. In comparative

studies researcher used isometric cervical neck muscle force measurement device and measured strength in both gender, showing the strength of cervical flexor and extensor muscles in females where 61% and 44% respectively of that in male subjects^{[9][10]}.

Isometric strengthening is effective in neutral position that at various degree. Garces et al(2002) studied on isometric neck strength at different degrees on 94 volunteers and concluded that neutral position of the head showed the maximum strength value as compared to different degree of neck range. To evaluate the neck muscle strength, force plate have been used by various researchers but few studies have done on pressure biofeedback to track the activity of muscle in various strengthening exercise^[11]. Vernon and Aker (1992) did an analytical survey to evaluate the neck muscle strength with sphygmomanometer and stated that it is a reliable instrument for evaluating isometric muscle strength in normal and symptomatic subjects. As far as to our knowledge, there is no literature demonstrating the use of pressure biofeedback in cervical spondylosis patient^[12].

Hence the study intent to find out the effectiveness of pressure biofeedback on conventional physiotherapy to maintain balance in cervical spondylosis patient.

Method

The study was designed as a experimental comparative group study. The study was approved by the ethical committee of Jyoti Rao Phule Subharti College of Physiotherapy, under Swami Vivekanand Subharti University, Meerut.

30 subjects randomly assigned into 2 groups (Group A and Group B) 15 in each for a duration of 4 weeks treatments in Physiotherapy OPD. After being fully informed about aims & methods of the study, all patients gave their written consent to participate.

The primary inclusion criteria were neck pain for more than 2 months of either gender between 30 to 50 year age group. Exclusion criteria were Cervical Trauma, Radiculopathy, Myopathy, Vestibular Pathology, Dizziness, Visual problems, Spinal fractures and dislocation, Hypertensive, Diabetic mellitus. We also excluded any trauma or pain in Thoracic, Lumber, Hip, Knee & Ankle region.

All the patients in both the groups were assessed on day 1 & last day of 4th week of training session by using following parameters:-

1) Modified clinical test for sensory integration in balance (CTSIB): This requires the subject to maintain balance in quiet standing in four different sensory conditions maintaining for 30 seconds. In 1st condition subject was made to stand on the floor with

eyes open, in 2nd condition, standing on the floor with eyes closed where as in 3rd and 4th condition subject was instructed to stand on a foam with eyes open and closed respectively^[13].

They were instructed to stand barefoot for all the conditions with their hands crossed across the chest with the feet 10 cm apart. In condition 1 and 2 patient were instructed to stand 50 cm away from the wall on footprint marked on the floor. In condition 3 and 4 a medium density foam was placed 25 cm away from the wall on which footprints were marked. A laser pointer mounted on a waist belt tied around the iliac crest. A sheet of graph paper was stick on the wall to record the postural sway by using a pencil to mark the extremes of excursion of the beam in anteroposterior direction. The trial was terminated if any following occurred^[14]:

- Startle response of extremity.
- A step initiated
- Loss of balance.

2) Numeric Pain Rating Scale (NPRS): A scale of one to ten on which subject were made to grade the intensity of pain^[15].

3) Neck Disability Index (NDI): This questionnaire is designed to give the information as to how neck pain has affected the patient's ability to manage in everyday life^[16].

4) Pressure Biofeedback (Simple Sphygmomanometer): it is used to measure the neck muscle strength. It was consist of 3 chamber air filled pressure bag, a catheter & sphygmomanometer gauze. To measure the strength, cuff is placed under occipital in supine position for neck extensor and under forehead in prone position for neck flexor muscle. After setting pressure with the baseline of 20mmHg, patient was asked to put maximum effort on cuff by giving 6 seconds hold for 3 repetitions. After taking the mean value, it is compared with the normal extensor flexor i.e. 1.7:1^[17].

Protocol

Before starting the session in both groups, all the participants received Moist Heat Pack on cervical region for 10 to 15 minutes followed by isometric strengthening of exercise which was as follows:

Group A: Isometric strengthening exercise by using pressure biofeedback:

Patient made to lie down in supine with the head in neutral position and the cuff of placed behind the neck under the occipital region. The patient asked to press the neck against the cuff till the pressure gauze shows the target pressure which was turned towards the patients so that the patient was able to see how

much pressure they were exerting. The pressure was hold for 6 seconds and repeated for ten times.

Group B: Isometric strengthening without pressure biofeedback:

The position of the patient was in supine with the head in neutral position. The patient was asked to press the head maximally on the treatment table or couch with six second hold for 10 repetitions which was carried out for 5 days a week for 4 weeks.

Limitation of Methodology

The laser pointer beam was occupying 0.5cm of space on the graph paper, so the postural sway could not be calculated to the accuracy of mm.

Data Analysis

All the analysis was obtained using software SPSS version 20. Demographic data of patients including age and gender was summarized. The 4 parameters were used to analyse the outcome of treatment namely NPRS, NDI, Modified CTSIB and Pressure Biofeedback.

These scores indicates pain, neck disability, postural sway and neck muscle strength respectively as perceived by individual due to cervical spondylosis. The independent t test and paired t test were used to find the significance of improvement within the group and between the groups.

Result

A sample size of 30 patients (Group A – 15 and Group B – 15) was studied.

Pre and post data were collected on 1st and 27th day of treatment.

Table-1 present mean & S.D. for age and gender of both groups. There was no gender bias in the distribution of sample in experiemental and contro group. The number of patient in both the groups where comparable, although it appears that there was more female patients in experimental group, the difference was not significant as per calculated X² value.

Table 1: Demographic data of control and experimental groups

Groups	Gender		Age (yrs)	Mean (yrs)	SD
	Female	Male			
Experimental	9	6	30-50	38.06	2.19
Control	8	7	30-50	39.9	2.32

The result in Table-2 explain the comparison of pre treatment score for experimental and control groups. All the parameters used for study were tested for homogeneity before the start of intervention using chi-square as well as 't' test. It was found that both groups were statistically homogenous at the start of the study. No significant difference was noticed in the mean score of two groups in all the parameters.

Table 2: Comparison of pre treatment score for experimental and control group

Variables	Experimental Group		Control Group		Independent t value	P-value
	Mean	SD	Mean	SD		
NPRS	5.6	1.36	5.06	1.43	1.08	>0.05
NDI	6.73	2.61	7	2.1	0.313	>0.05
Condition 1	2.8	0.42	2.55	0.51	1.48	>0.05
Condition 2	4.33	0.65	4.23	0.54	0.46	>0.05
Condition 3	5.6	0.58	5.43	0.68	0.74	>0.05
Condition 4	8.2	0.56	7.9	1.03	1	>0.05
Extensor strength	14.73	7.46	13.2	7.43	0.56	>0.05

Table-3 and Table-4 shows the difference of all the four parameters from pre to post in experimental & control groups. It explain the significance of treatment after 4 weeks in both groups, the value has come highly significant by performing independent 't' test. The table value at 95 degree of freedom was significant of P<0.05. But when we see the result between the groups of post treatment score in Table-5, the difference was not statistically significant i.e. P> 0.05, so comparison supports null hypothesis.

Table 3: Difference between pre and post treatment score in experimental group

Variables	Mean	SD	Paired t-value	P-value
NPRS	3.2	0.68	18.39	<0.05
NDI	3.66	0.36	10.16	<0.05
Condition 1	1	0.27	14.7	<0.05
Condition 2	1.3	0.57	8.9	<0.05
Condition 3	1.26	0.53	9.26	<0.05
Condition 4	2.66	0.62	16.73	<0.05
Extensor strength	18.33	8.81	8.05	<0.05

Table 4: Difference between pre and post treatment score in control group

Variables	Mean	SD	Paired t-value	P-value
NPRS	2.07	1.36	9.13	<0.05
NDI	4.2	1.52	10.71	<0.05
Condition 1	0.84	0.39	8.23	<0.05
Condition 2	1.37	0.47	11.77	<0.05
Condition 3	1.36	0.67	7.82	<0.05
Condition 4	2.4	0.82	11.32	<0.05
Extensor strength	14.46	7.29	7.67	<0.05

Graph 2: Pre to Post Condition 1 & Condition 2 of Experimental & Control Group

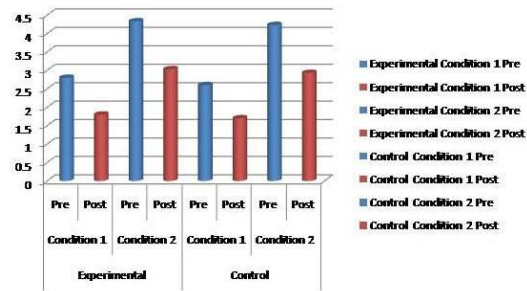
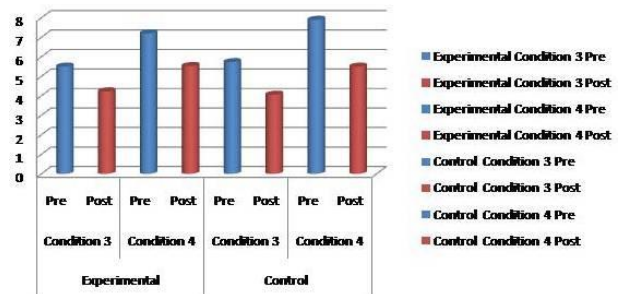


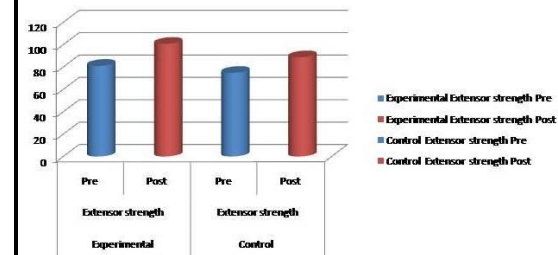
Table 5: Comparison of post treatment score for experimental and control group

Variables	Experimental Group		Control Group		Independent t value	P-value
	Mean	SD	Mean	SD		
NPRS	2.4	0.98	3	1.13	1.55	>0.05
NDI	3.06	1.53	3	1.1	0.2	>0.05
Condition 1	1.8	0.17	1.73	0.26	0.89	>0.05
Condition 2	3.03	0.63	2.43	2.4	0.16	>0.05
Condition 3	4.23	0.46	4.06	0.62	0.86	>0.05
Condition 4	5.33	0.31	5.51	0.8	0.13	>0.05
Extensor strength	32.8	11.34	27.66	9.34	1.35	>0.05

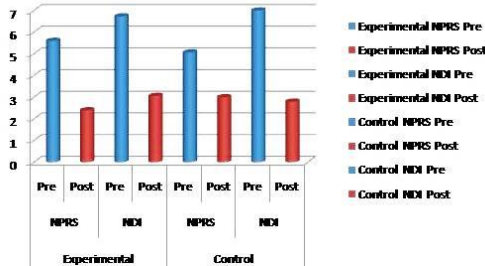
Graph 3: Pre to Post Condition 3 & Condition 4 of Experimental & Control Group



Graph 4: Pre to Post Neck Extensor Strength of Experimental & Control Group



Graph 1: Pre to Post NPRS & NDI of Experimental & Control Group



Discussion

It was found that neck instability in cervical spondylosis patient can affect their ability to maintain good postural control during daily lives. If the imbalance between the flexor & extensor of neck muscle occur which cause pain in neck, disability and alteration of proprioceptive sensation from joint capsule and neck musculature. In this case it is important to relieve and prevent the recurrence of pain, thus strengthening the neck musculature not only prevent musculoskeletal system disease but also minimise the postural sway.

To identify the effectiveness of strengthening exercise on neck muscle 15 subjects were taken into two

groups and were asked to perform neck extensor isometric contraction in neutral position.

The result showed that the pain, disability and postural sway was reduced in both the groups after 4 weeks of pre to post treatment session. Gosselin et al (2004) observe quick neck muscle fatigue in patients with chronic neck pain which in turn affect the postural control induce postural instability which not only affect the neck function but also affect the balance in a standing posture^[18]. Caroline et al (2003), Welmer et al (2005) reviewed the study on effect of neck extensor muscle fatigue on balance after 5% and 25% of maximal voluntary contraction for 15 minutes and concluded that there was increased displacement of COG while standing with eyes open.

Maryan Mazidi et al (2017) suggested that neck strengthening exercise should be done on a regular basis to increase the neck muscle endurance, thus making these muscle resistance to fatigue^[19].

Studies have proven that neck extensor gets fatigue faster than the flexor could be because of majority of activity done in forward neck bending position which require continuous load on extensor. Jordan et al (1997) measured the maximal isometric strength of cervical musculature in 100 healthy volunteers in both gender and concluded that man and women demonstrated impressive level of muscular strength in flexor extensor ratio which was approximetaly 1:1.7^[20]. Another study was done by Kumar et al (2001) on females and found the strength ratio between flexor and extensor was 1:1.7. Extension of this study repeated by Petri K et al (2006). He found the flexor to extensor ratio was 1:2.8. They explained that this difference was due to use of different device to measure the strength^[21]. In this study, 1:1.7 ratio was used as a base line for flexor extensor strength. To strengthen the neck musculature isometric strengthening exercise done by all patient in neutral position. Guy Gosselin & Michael J.Fagan(2014) quantified the effect of neck muscle fatigue on EMG activity and found its co-relation with balance and stability. The study was done on 44 Rugby players who resisted approximately 35% maximum voluntary isometric contraction on force plate for 15 minutes in 8 different directions and concluded that there was a significant increase in sway velocity in neck extension direction which was due to the extensor muscle higher density and distribution of muscle spindle in posterior sub occipital muscle which contain 100 time more muscle spindle susceptible to fatigue and hence there was a greater loss of proprioceptive function^[22]. This is one of the reason why extensor of neck muscle need to be strengthen on a daily basis.

The strengthening exercise would be much effective if patient can quantify and visualise the force exerted by them. In this regard pressure biofeedback could be the choice of treatment because it can be considered as a alternate approach to indirectly measure muscle

activity. It is one of the valid and reliable instrument which is noninvasive, low cost & portable. Pedro O.P. Lima et al (2012) & Da-eun Jung (2014) used pressure biofeedback for treating abdominal muscle activity in normal and chronic non specific low back pain patient^{[23][24]}. The result of this study showed significant improvement for pre to post treatment ($P < 0.05$). But when comparison was done between group A and group B, it was not statistically significant ($P > 0.05$). The reason behind could be so, that in group A (Experimental) the patient were given a target to achieve on the basis of their neck flexor extensor ratio strength. It could be possible that they were bound to press the cuff of PBU not on the basis of their maximum isometric voluntary contraction but the target which had been set for them, where as in group B (Control) the patients were simply told to exert the pressure maximally on the treatment table without any set target.

This consistency raises the possibility of using PBU in physiotherapy & rehabilitation session for those patient who has difficulty & problem to understand how much pressure need to be exerted by maximal isometric contraction on treatment table.

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Conflict of Interest: None **Financial Support & Sponsorship:** None

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Original study

Short term effect of Positional Release Therapy versus conventional Physiotherapeutic programme on pain and disability among undergraduate Physiotherapy students with non-specific neck pain: A Pilot Study

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Abstract

Background: Non-specific neck pain is characterized by self-reported pain experienced in cervical region. It is a common musculoskeletal disorder in the general population. Often disorders of the cervical spine include neck pain with or without radiation to the upper limb and headache. The pain may arise from several structures in the cervical region, including the joints and soft tissues. In fact, 10% of people will have neck pain in any given month. Potential pain generators include bones, muscles, ligaments, facets joints and intervertebral discs. Almost any injury or disease process within the neck or adjacent structures will result in reflexive protective muscle spasm resulting pain and disability to cervical region. There are various Physiotherapy approaches towards in managing this problem. Thermotherapy and other modalities like ultrasonic therapy, Interferential Therapy, radiation therapy are used in case of soft tissue related problems. On the other hand, lot of literature purport that Positional release therapy (PRT) is a good approach in reducing symptoms in patients with neck pain, often in muscle trigger points, fascia tightness, muscle soreness and muscle spasm at and around the cervical region. The purpose of this study is to know the comparative effect of Positional release therapy versus conventional physiotherapeutic programme in reducing pain and disability in patients with non-specific neck pain. **Material and Method:** The study was a randomized controlled trial with a sample of 10 subjects, 6 were female, 4 were male, and all subjects were assigned according to criteria (inclusion & exclusion) and carried out at physiotherapy OPD of CSS Hospital, Meerut. The subjects were equally divided into two groups such as group A (5 subjects, 2 male and 3 female), Group B (5 subjects, 2 male and 3 female). Pain and disability was assessed by using VAS and NDI questionnaire respectively. The subjects were reassessed at 3 weeks after completion of intervention. **Statistical Analysis:** All analysis was obtained using SPSS version 20.0. Demo graphic data of the patients including pain and disability were summarized. The dependent variables for the statistical analysis were VAS and NDI score. A base line data was taken and analyze. Paired and unpaired t-test was used in this study. A level of significance 5% was used to determine the statistical significance. **Results:** On measurement of Mean, Standard Deviation, t-test value and p-value, the results showed that there was significant difference in pain and disability with their VAS and NDI score ($p=0.000$) respectively. On comparison the data of group A showed significant difference in pre to post score VAS and NDI than the data of group B. **Conclusion:** Study concluded that the difference from 1st to 21th day in VAS & NDI score which shows that Positional release therapy (PRT) is more effective than conventional Physiotherapeutic programme in order to decrease pain and disability in patients with no-specific neck pain.

Key words: Positional Release Therapy (PRT), VAS (Visual Analogue Scale), NDI (Neck Disability Index).

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Introduction

Musculoskeletal pain symptoms in neck are a common subjective health complaint. Neck pain tends to have high socioeconomic consequences in terms of health expenses and loss in working days. Individuals who have a sedentary life, monotonous repetitive work tasks like, e.g. A white collar official, neck pain is the most prevalent musculoskeletal complaint. The etiology of these musculoskeletal pain symptoms could be multifactorial which involve several physical and psychological risk factors. Both specific muscle training and all-round physical exercise have shown beneficial effects on neck pain¹. Spinal manipulation and mobilization are also therapies employed for neck pain; studies have shown, the reduced direct cost for mobilization (alone or in combination with other modalities) compare to

analgesics, anti-inflammatory drugs. Multimodal care that includes mobilization and or manipulation with exercise is beneficial for neck pain relief and functional improvement.

Neck pain is characterized by self-reported pain experienced in cervical region. It is a common musculoskeletal disorder in the general population². Often disorders of the cervical spine include neck pain with or without radiation to the upper limb and headache. The pain may arise from several structures in the cervical region, including the joints and soft tissues³. In fact, 10% of people will have neck pain in any given month. Potential pain generators include bones, muscles, ligaments, facets joints and intervertebral discs. Almost any injury or disease process within the neck or adjacent structures will result in reflexive protective muscle spasm resulting pain and disability to cervical region⁴.

Recently, evidence has begun to emerge for the use of manual procedures directed at the cervical spine for patient non-specific neck pain. Lawrence H. Jones invented Positional release therapy (PRT). This technique involves passive body positioning, which is claimed to elicit immediate and prolonged reductions in tenderness at trigger points and to reduce pain and with musculoskeletal conditions. PRT relies on precise positioning of dysfunctional tissues in ways that allow a spontaneous response that releases or reduces excessive tension and/or spasm. The mechanisms are thought to result from spindle resetting, reduction in nociceptive sensitivity and circulatory enhancement⁵.

Objective

Short term effect of Positional Release Technique (PRT) versus friction massage on pain and disability among undergraduate Physiotherapy students with non-specific neck pain

Hypothesis

Experimental Hypothesis [H1] – There will be significant difference between the effect of Positional Release therapy versus Conventional Physiotherapeutic programme on pain and disability among under graduate students with non-specific neck pain

Alternative Hypothesis [H0] - There will be no significant difference between the effect of Positional Release therapy versus Conventional Physiotherapeutic programme on pain and disability among under graduate students with non-specific neck pain

Materials and Methods

A total of 10 undergraduate Physiotherapy students at Subharti College of Physiotherapy, were accessed after obtaining patients consent form. Students, both male and female of age 18-25 years were participated in this study. Duration of pain less than 1 month (Sub-acute)⁶, VAS score of more than or equal to 5, NDIQ score of more than or equal to 15 score, All participated students able to attend at least 3 sessions per week for at least 3 weeks, be in good health were included in the study. In our study exclusion Criteria⁷: were Any Congenital anomalies like cervical rib etc., past history of Cervical Trauma, Cervical Radiculopathy, Patient with bilateral trapezius spasm, history of trauma or fracture in upper limb neck, patient suffering from Diabetes Mellitus, any Patient with history of recent surgery to neck or upper back., any patient with neurological complication and any patient with psychological complication were excluded.

Group-A MHP+PRT (Moist hot pack + Positional Release Therapy)

Group-B MHP+TENS (Moist hot pack + Transcutaneous electrical stimulation, Consisting 5 participants in each group

Outcome Measures

Visual Analogue Scale (VAS): The visual analog scale is one of the most basic pain measurement tools. It consists of a 10 cm line. The clinician can measure the place on the line and convert into it a score

between 0 to 10 where 0 is no pain and 10 is bad as it could be⁸.

Neck Disability Index (NDI) Questionnaire for functional disability: The NDI was scored from 0–50 points (0–100%) in which higher scores correspond to greater levels of disability. Using this system, a score of 5–14 points (10– 28%) was considered to constitute mild disability, 15–24points (30–48%) was considered to constitute moderate disability, 25–38 points (50–68%)was considered to constitute severe disability, and scores above 34points (68%) indicate complete disability⁹

Procedure

Application of Moist heat pack (MHP) - After assessing the patient, the subjects were first given hydrocollator pack on spasm/tender point area (upper fibers of trapezius muscle unilaterally) region for 15 minutes in both groups to reduce muscles spasm and pain and to improve the extensibility of tissues. The temperature of hydrocollator pack was adequate for the targeted area. The hydrocollator pack was well covered with mackintosh sheet. During this phase therapist asked the patient about temperature of hydrocollator pack and his/her suitability towards the procedure.

Application of TENS- The negative electrode of the TENS unit will be placed on the MTrp (myofascial trigger point) of the upper trapezius muscle and the positive electrode on the acromion tendon insertional site of the trapezius muscle. The current to be applied at a pulse repetition frequency of 100Hz and duty cycle of 250s, the intensity will be set at a level that each subject should feel but will not be strong enough to induce muscle contraction. The current needs to be applied for 20 minutes¹⁰

Application of PRT-Total 30 subjects were given Positional Release therapy after application of MHP for 15 minutes as described above. The subject was in supine with therapist standing on the affected side, tender points were located along the upper fibers of the trapezius. Then therapist applied Pressure by pinching the muscle between the thumb and fingers. The subject's head was laterally flexed toward the side of tender point, then therapist grasps the subject's forearm and abducts shoulder to approximately 90° and adds slight flexion or extension to fine-tune. The ideal position of comfort achieved was held for a period of 90 seconds and followed by a passive return of the body part to an anatomically neutral position continued for 5minutes. Treatment duration: 3 sessions per week for 3 weeks. i.e. students will receive 3 sessions/ week of interventional therapy for the duration of 3weeks.

Data Analysis

All analysis was obtained using SPSS version 20.0. Demo graphic data of the patients including pain and disability were summarized. The dependent variables for the statistical analysis were VAS and NDI score. A base line data was taken and analyze. Paired and unpaired t-test was used in this study. A level of significance 5%(*) was used to determine the statistical significant.

Result

Table:-1, Showing comparison of VAS score between group A and group B

Groups	Time Period	Mean	SD	SEM
Group- A	Pre	5.02	2.17	0.51
	Post	1.31	0.83	0.43
Group-B	Pre	5.13	2.41	0.78
	Post	3.07	1.47	1.03

Graph: 1, Showing difference between pre and post VAS score

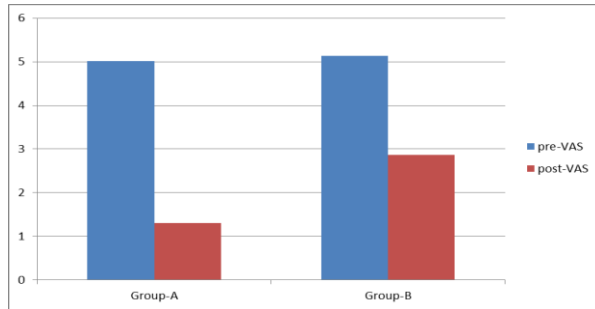


Table:-2, Showing comparison of NDI score between group A and group B

Groups	Time Period	Mean	SD	SEM
Group- A	Pre	20.02	4.17	2.53
	Post	7.31	2.83	0.76
Group-B	Pre	19.43	3.79	1.91
	Post	9.47	3.67	2.14

Graph: 2, showing difference between pre and post NDI score

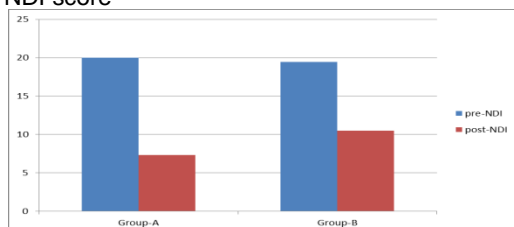


Table:-3, Showing comparison of t-test value and p-value of VAS between group A and group B

Groups	Time Periods	t-test	p-value	Significance
Group-A	Pre-Post	17.34	0.003*	Significant
Group-B	Pre-Post	15.87	0.317	Non-significant

Table:-4, Showing comparison of t-test value and p-value of NDI between group A and group B

Groups	Time Periods	t-test	p-value	Significance
Group-A	Pre-Post	19.84	0.001*	Significant
Group-B	Pre-Post	16.97	0.287	Non-significant

Discussion

This study provides data for pain and disability of persons who had complain of low back pain with radiculopathy. The data is sparse in between 18-24 year age group since it was convenient to find people in this age group who could fit the inclusion criteria in this study.

In this study, data shows there are decreasing in VAS score and NDI score in patients with non-specific neck pain. Both treatment Positional release technique and conventional Physiotherapeutic programme are effective in reducing pain and disability in patients with non-specific neck pain. But Positional release technique is more effective than conventional Physiotherapeutic programme in order to decrease pain and disability.

Manual therapy technique, in which trigger points are used, is Strain Counter-strain (SCS) or positional release therapy (PRT). This technique involves passive body positioning, which is claimed to elicit immediate and prolonged reductions in tenderness at trigger points and to reduce pain and with musculoskeletal conditions (Jones et al., 1995 and Kusunose, 1993). A number of studies have reported the use of strain/counter-strain in combination with other interventions for treating a variety of disorders, including chondromalacia patellae, low back pain, and cervico-thoracic pain (Lewis and Flynn, 2001; Radjeski et al., 1998)¹¹.

Data of VAS and NDI of two Groups, Positional release technique group and conventional

Physiotherapeutic program for pre and post interventional study are expressed in terms of mean, S.D and S.E.M is shown in table-1 and 2 respectively. Further application of independent t-test implemented (table-3 and 4) to find the significant difference between pre and post intervention study between Positional release technique group and conventional Physiotherapeutic program, which revealed significance difference for the patients of group-A individuals at 5% level of significance.

The 3 weeks protocol of Positional release therapy and conventional Physiotherapeutic program showed difference in two groups individually in order to decreasing the pain and disability but experimental group A, Positional release technique showed statistically more significant difference in decreasing pain and disability. In group-A, p-value was significant i.e., $p < 0.05$ with VAS and NDI score (0.0000) and (0.0000) respectively.

Conclusion

The result of this study suggested that both the treatment method are effective in both the groups i.e. group A and group B of patients of non-specific neck pain but group A treatment method i.e. positional release therapy is more effective than treatment method of group B i.e. conventional Physiotherapeutic programme. This study revealed that both the experimental group showed the difference in VAS and NDI scores. But group A, showed the significant difference in VAS and NDI scores. This study concludes that the patients who received Positional release therapy along with moist heat pack had less pain and disability as compared to those received conventional Physiotherapeutic programme. Finally, this study stated that Positional release therapy is more effective than conventional Physiotherapeutic programme in order to decrease pain in patients with non-specific neck pain.

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Review Article

Communal Violence: A Black spot on the face of democratic country

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Abstract

Communal riots have become a distinct feature of communalism in India. The reason for such a clash could be superficial and trivial, though underlying them are deeper considerations of political representation, control of and access to resources and power. Local economic rivalries, political games, and international tensions brought a new awareness of difficulties and discriminations.

Keywords: Communal riots, Social causes , Political Causes, Religious Causes

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Introduction

whenever conflicting groups from two different religions called as communal riot. Communal riots have become a distinct feature of communalism in India.¹ There have been many incidents of riots recorded during the course of British period and after independent India². The main responsible factors for the communal violence may be discussed under the following factors:

(1). Socio-Political factors (2). Economic Factors (3) Religious factors and (4). Trivial factors

1. Socio-Political Factors

Often socio-political issues also engineered communal violence. In most cases the communal violence is politically motivated. There is a growing tendency to maximize political gains by adopting short cuts in terms of usage of ancient identities, money and muscle power, communal slogans, doctrinaire issue, etc. The major cause of communal conflict before partition was the struggle between the Hindu and the Muslim elite for political power as well as control of economic resources at the national level.³

In communal violence several causes and multiplicity of factors are involved which contribute to the generation and aggravation of communal riots. In communal violence there are micro as well as macro factors involved. The micro factors may be non-ideological and of local nature. The macro factors are often of ideological in nature and have nation-wide sweep. Both are integrally connected with the process of socio-economic development in the country.

The history of Hindu-Muslim antagonism is the result of 'divide and rule' policy adopted by the British rulers, which left a wide impact on Hindu-Muslim relations. After the revolt of **1857**, the British rulers started to divide different communities on communal lines,

particularly Hindus and Muslims in India. The Indian ruling class continued the 'divide and rule' policy of the British rulers in the post-partition period in relation to the masses of the two communities to keep them divided and always fighting. The Indian ruling class continued the 'divide and rule' policy of the British rulers in the post-partition period in relation to the masses of the two communities to keep them divided and always fighting.⁴

The local Gorakshini Sabhas began springing up in many parts of Northern India from the late **1880s**, and became more militant and brought acute social tension. On the other hand, Muslim revivalist trends were simultaneously insisting on the necessity of the 'Bakharid' (i.e. the festival of sacrifice) sacrifices. Thus, the ground was prepared for communal violence in **1893**.

The division of Bengal in **1905**, based on religion was the unique example of fomenting communalism by the British policy of 'divide and rule'. Communal perception was again perpetrated through the political instrument of *separate electorates*, wherein religious minorities were given separate seats in the legislative bodies according to their proportion of population in the provinces. This widened the prevailing communal antagonism in the country.

Partition of the country also created a great deal of bitterness and communalized political processes in post-Independent India. Before partition, all were Indians, but after partition Muslims became a minority in India while Hindus and Sikhs became minority in Pakistan. Allegations of persecution of minorities in both the countries had been made from time to time. The seeds of distrust and disharmony have gradually taken shape of big trees and communal termite is slowly eating into the age-old roots of our peace.⁵

Communal riots are not caused spontaneously and also that they are rarely caused by religious animosity. They arise due to conflicting political interests, which are often linked to economic interests. During the time of partition, it was the clash of political interests of the elite of two different communities which resulted in communal riots.⁶

In 1967, the attempt to make 'Urdu', the second official language in Bihar, was the cause behind communal violence in Ranchi. The 1980s decade witnessed the highest degree of communalization of politics. In 1994, the introduction of a short 'Urdu News Bulletin' from the Bangalore Doordarshan (DD) had sparked off communal violence in Bangalore.

Due to the political issues communal riots occurred in many cities of India. In the late 80s, communal riots that broke out in Meerut (1987) and the Bhagalpur (1989) were directly the result of 'Ayodhya dispute', the dispute was essentially political in nature.

Weak law and order is one of the causes of communal violence. After partition, the most of communal violence took place because of the weak law and order. There was failure of the police and administrative officers in gauging the intensity of the communal situation in advance. The partisan role of state machinery particularly police goes in sustenance of communal violence and reactive motivation by the group feeling. The partisan attitude of police allows petty clashes to turn into a major communal violence.⁷

The Moradabad riots (1982) and the *Maliana* and *Hashimpura* episode in Meerut (1987) are the glaring examples of one-sided action of the Uttar Pradesh (UP)-Provincial Armed Constabulary (PAC). Looting and arson in this context was considered legitimate and necessary and was therefore ignored. The other examples of PAC being responsible for communal violence are noticed. V.N. Rai, an ex-police officer of UP held the police partisan as the cause of communal violence. [8] The partisan role of the police in Mumbai riots (1992-93), Gujarat killings and in Orissa riots (2008) has been equally shameful. The partisan role of the police in Mumbai riots is well documented in a compilation from the *Times of India*.

The politicization of the **Mandir-Masjid issue** and the subsequent demolition of the Mosque gave the BJP the opportunity to consolidate its vote bank. In the recent years the South Indian states, particularly Kerala and Tamilnadu, have also witnessed communal violence and are slowly growing into communally sensitive areas.

Communal violence has entered a new phase with the Christians and members of other minority religions being made the victims of planned attacks. There are many other factors also which contribute to the building up of communal tension. The increased prosperity of a group challenges the traditional political leadership of the town. This political rivalry leads to communally dangerous situations. Political rivalries assume dangerous extent in areas marked by a high level of political instability and social violence. Politicians have no interest in bridging the

gap between communities, but have, in fact, a positive stake in ensuring that it remains as wide as possible. They succeed in misguiding their ignorant co-religionists in the wrong direction and towards the wrong goals, which are against the interests of the people themselves. Hindus and Muslims cannot be treated as entirely homogenous communities. There are besides religious conflicts, conflicts of interests too. On occasion, these interests sharpen religious conflict.⁹

Communal conflict/communal of interest does not seem to originate in the ignorance of 'true religion' but in the struggle for autonomy on the part of one or more groups and there is an inescapable conflict between their drive for autonomy and the cohesion of the state in a multi-religious society. Politicization of religion, conditions of extreme scarcity and a particularly divisive style of politics aggravate the problem, which appears to be basic to heterogeneous societies.

False and exaggerated rumours pave an easy way to communal violence. Rumours are circulated rapidly and their distortions grow with each repetition. It should be the imperative duty of the district administration to counter rumours floated around by unscrupulous persons. In almost all riots the role of rumours in rousing communal zeal is quite famous. Rumour plays a mischievous role in fanning the flames in a surcharged atmosphere. It is always a key in the hands of communal elements to engineer communal violence. The most effective to incite the mass is the rumour of the women or girl of one community being molested, raped or kidnapped by the members of another community; or the killing of a prohibited animals by a Muslim; etc. In 1961, rumours played a vital role in Jabalpur riots. The communal violence was provoked by rumours about a Hindu girl being assaulted by two Muslims. The main cause of Nellie, Assam riot (1983) was rumour that the Bengali Muslim had cut off the breasts of Hindu women and displayed them in the Hindu areas to show their power. In Bhagalpur riots (1989) too, the role of rumours was significant. During Gujarat killings (2002), the Gujarati press became the agent provocateur. *Sandesh* published false reports, rumours and biased reports, which aggravated the flames of communal violence.

In December 1990, during the second phase of *karseva* in Ayodhya, violence broke out in many cities of India.¹⁰ This false story has spread like wildfire across Gujarat and was compounded by extreme sexual violence and bestiality against Muslim women. Godhra was indeed the first major communal riot that got such a wide media coverage particularly from the satellite channels. Therefore the media now needs to be more responsible, considering the influence that it can have over the masses. It is time that the media stopped any kind of biased reporting as it can further encourage the communal elements to instigate the masses. Political parties have always had a hand in instigating and exploiting communal violence so as to meet their electoral interests.

During communal violence, there is no free exchange of views and opinions between the two communities and both the communities perceive as inimical. Such absence of inter-group communication is favorable for communal violence. During communal violence, both communities paste and distribute posters and pamphlets thereby increasing communal tensions and continuation of communal violence. Such communication preaches communal hatred and prejudice to incite communal violence. Isolated individual instances of injustices and loss, rightly or wrongly are published and communicated in the newspapers and consequently communal groups get support for continuing communal violence, as one community perceives that the other community committed violent acts against it.¹¹

Communal violence takes place, as members of one community perceive the threat, harassment, fear and danger from the members of the other community. The response to the threat is either fight or departure. The latter generates fear and terror and the former cause's hatred and anger phobia. There is a lack of inter-personal trust and mutual understanding resulting in subsequent fear and worry among the communities. During communal violence, neighbors and acquaintances become enemies to one another. Though they are staying nearby, some persons from the same locality participate in communal violence. Thus, the people known to each other over a period become assailants. During communal violence, there is lack of rapport between the people and police. People do not report many communal incidents to police, as they are afraid of personal assaults by the criminals in the absence of adequate protection by police. An individual personal attack is sometimes misconstrued as an attack against the entire community. As a result, people become scared and frustrated and thereby more violence takes place.

2. Economic Factors

Economic competition often leads to social tensions that can easily turn into communal violence. An important cause of communalism and communal violence springing from it has been unbalanced and exploitative economic relations in Indian society. In 1929, Mumbai riots were explained at the time as the outcome of an economic conflict between Hindu strikers and Muslim strike breakers, mixed in with Hindu antipathy towards Muslim moneylenders in the city. Several accounts of the partition riots in Punjab have also focused on the role of land shortages and conflicts between indebted Muslim farmers and mainly Hindu money lenders in the country side and between Muslim and Hindu business interests in the cities.¹²

After independence, however, as riots have become much more urban in nature, most economic explanations of riots have focused on either: (i) economic competition due to Muslim craftsmen moving up in the economic division of labour and beginning to compete with Hindu merchants; or (ii) riots stocked by urban land mafias in an attempt to displace one community from increasingly valuable

urban real estate. Due to the economic factors communal violence occurred in the industrial belt of country. Communal Violence have mostly occurred in urban towns which are either industrial belts or trading centers with the economy largely based on a particular occupation. Most of urban towns places had a considerable percentage of Muslim population whose political or economic interests clashed with those of the Hindus. Riots in this phase might have occurred in the villages or rural areas like the Bihar Sharif riots, but they have often remained unreported. Various case studies disclose that in period before Ayodhya issue violence took place in cities where Muslim artisans and weavers took over the trading of their products from Hindus. The intense economic competition led to conflicts and riots. The Gopal Singh Committee in its Report (1983) also testifies to the economic factors, local rivalry, acquiring control over and sharing of the gains of economic ventures.¹³

It is asserted that most of the employers, industrialists, etc., are Hindus, whereas most of the workers and artisans are Muslims. The economic factors played a significant role at those industrial places where Hindus and Muslims both were engaged in the same industry. The problem becomes complex, where Muslims occur to be wage-earning artisans. The riots in Moradabad, Khurja, Aligarh, Bhagalpur, Ahmedabad, Baroda and Surat were specially targeted because in these towns Muslim craftsmen, artisans, foundry owners and weavers reap the reward of favorable economic climate and trading relations with oil rich Gulf countries.¹⁴

Often, communal forces exploit the economic backwardness of their community to mobilize it against other community. The economic crisis in our society leads not only to communal violence but also to atrocities over women, Scheduled Castes (SC) and members of weaker sections of society. The present inflation and worrying economic condition is also responsible for communal violence. Business rivalries are also regarded as the cause behind the communal disturbances. The society is so interdependent in its business activities that it is difficult to visualize a situation where give and take among various sections is non-existent. Hindu and Muslim entrepreneurs and artisans cannot flourish without each other's assistance. Any bitterness in their relationship would affect the whole industry adversely. The comparative economic prosperity among the Muslims leads to greater political aspirations among them. This results in a communally dangerous situation. During the last few decades, a perceptible qualitative difference is being felt in many towns. Communal forces have identified certain contradictions in their relationships to create situations in which further communal clashes are encouraged. The contribution of land mafias in communal violence is visible in Ahmadabad and Mumbai. In Hyderabad riots (1990-91), it was found that the role of land mafias in collaboration with their political mentors was derisive in engineering and sustaining these riots for long periods.¹⁵

The riot of Bhiwandi (1970) is the clear example of business rivalries among traders resulting in planned and organized attacks on the looms working for rival traders. The economic targeting of Muslims in the Gujarat riots (2002) is unprecedented. Muslim businesses have been systematically destroyed. The Tribunal recorded extensive evidence of the divesting loss of property of the Muslim community in the state. Due to business rivalry, the anti-social elements are encouraged to attack the opposite business establishments. The theories of class conflict, viz., class stratification coinciding with religious cleavages or the dominant property group trying to raise bogie of majority communalism in order to mute or deflect the rising demands of the minority. In India, communal identity and division has always pervaded Indian society but communalism is one of the by-products of Colonial underdevelopment of the Indian economy. The rise of modern politics and social classes occurred in the same period and the crises of Colonial economy began to be largely felt. Colonial economy, underdevelopment and economic stagnation produced conditions conducive to the growth of internal divisions and antagonism within society. The internal divisions promoted communal violence and social tension at the mass level. Some scholars argue that all classes in the society behave differently according to their economic needs, which when triggered off by a religious issue, lead to communal violence. They attribute class struggle as the root cause behind several communal disturbances, not religion. Some scholars believe that after partition of the country, Indian Muslim developed the psychology of being the deprived group. Thus, an incident, which may be trivial in nature, leads to a chain reaction ending in violence.¹⁶

3. Religious Causes

Religion is an important factor responsible for the origin or growth of communal violence. However, religion acts more as an agent determining the attitude of its followers than the motivation or mainspring of communal violence. Religion has become a cat's paw in the hands of unscrupulous elements. Religious conflicts are the expressions of beliefs on the ground of superiority. The man is influenced by instinctive impulse and remains on the brute plane and due to ignorance, fear and fancy; deceit becomes dominant with cruelty, jealousy and violence.

The new found faith in religion by the communities has, however, given rise to several problems. Every religion teaches its followers that its understanding and interpretation of God, Prophet, etc., is the best and the ultimate. The tremendous faith in one's religious beliefs and a feeling that nonbelievers in these are misguided people who derive to be told regarding the correct path, lead to conflicts, which may be termed as religious conflicts. Normally, the destruction of places of worship of other community and forced or voluntary conversions were supposed to be part of religious duty. However,

religious/communal groups in free India continue to exploit the situation; the tug of war between them has intensified the communal divide; their leaders thrive on spreading hatred. One believes in extermination of the other group the other in retaliation. The communal violence is thus organized by vested powerful semi and quasi-politically affiliated groups. It is, therefore, necessary that such organizations should not be allowed to ransack the lives and properties of innocent people. Though religious festivals and processions are generally the starting points of communal riots, still sufficient security is not provided during these times. There is also not much response against incidents of communal violence from the civil society.

The manipulation of religious processions by political leaders is an old phenomenon. Processions became significant vehicles of violence, when local power politics was at stake. Communalists use religiosity for boundary definitions in political and other spheres. Their emphasis remains on religious festivals, processions, etc. They try to promote solidarity by exaggerating incidents when such processions have been infringed upon. Recently, due to religious celebrations and processions communal disturbances have been reported.

Thus, religious processions become an irritant for causing communal violence. Further, other religious processions, on occasions of both Hindu and Muslim festivals are primary factors responsible for communal violence. Very often, provocation due to hurting of religious sentiments resulted in the communal violence.

In December 1986, communal riots broke out in Bangalore and Mysore, because of defamatory article against last Prophet of Islam. The Moradabad riot (1980) was due to the intrusion of a pig into the Idgah during 'Eid' prayer. Both politicians and priests of their religion succeed in stoking the flames of communal hatred, bias and prejudice and in triggering communal clashes whenever convenient to them. Due to frustration and stress, people become more religious and as a result, communal bodies are flourishing all over the country taking advantage of liberal democracy and freedom of association. The activities of religious groups, by spending on religious and semi-religious activities have been held responsible for communal violence. The real cause of conflict between two communities in Moradabad riots (1980) was economic competition and the increased degree of spending on religious and semi-religious activities. Thus, such activities could easily cause a greater degree of hostility among the other communities and succeeded in creating an atmosphere for communal violence. Sharp reactions are also seen where any place of worships erected or established by one community in an area where the other community exceeds in numbers.

The Muslim fundamentalists often brand the Indian State as 'Hindu'; Hindu fundamentalists accept this and start prescribing a code of conduct for all 'Muslims', and they charge 'Muslim' with being

strongly organized and blind supporters of their own co-religionists. Muslims accept this allegation and claim that if they do not defend their religion the 'Hindus' will stamp out Islam. Thus, Hindu fundamentalists view minorities as enemies of the nation and communal violence as deliberate acts intended to humiliate and injure the Hindus. While Muslim fundamentalists view communal violence as well organized and pre-planned, and designed to terrorize the Muslims—to depress them, to drive them out of their own areas and to reduce them into second-class citizens.

Fundamentalists in either community use their influence in creating certain biases. They have taken all possible opportunities to incite the minds of the people and at times even resorted to the use of foul language. However, it cannot be ignored that Hindus and Muslims have deep-rooted prejudices against each other, which are taken advantage of by the fundamentalists. For instance, by mobilizing the masses on communally sensitive issues, the communalists succeeded in inflaming the already existing prejudices.

The fundamentalists exploit the discrepancy between the self-perception of one religious group and perception of it by the antagonistic communal group to spread fear, suspicions, mistrust and insecurity among their co-religionists. Thus, fundamentalists of one group, instead of maculating the communalism of another group, feed and fatten it through violence or communal propaganda. Religious fanaticism among the people also has its source in the constant preaching and actions of communal organizations. Since they are interested in sharpening the differences between religious groups, it is in their interest to make their followers hard-boiled, unreasonable and passionate followers of manipulated form of the religion concerned, a form which is, in fact, farthest from the actual tenets of the faith.

That is why it is a common feature, observed in every religious/communal group, to unite whenever the 'religion in danger' slogan is raised. Politicians and priests mobilize people around this slogan, and they preserve in keeping the slogan alive all the time. This fostering of fanaticism is of course, facilitated by the ignorance and the lack of awareness amongst the people. That is why vested interests have a stake in keeping ignorant as many people as possible and as long as possible.

Proselytisation (Conversion) is a source of communal conflict and communal violence. The conversion issue intensified communal discord in the country and resulted in communal violence in many parts of the country. Frequent conversions caused a great resentment among people. During the continuous phases of communal violence in Bengal from 1905 to 1947, conversion was one of the main causes of communal violence. The communal violence in Ahmadabad, Pune and Sholapur in 1982 had been the direct result of the Meenakshipuram conversions. The recent communal violence against the Christian

community in Gujarat, Madhya Pradesh (MP) and Uttarakhand and particularly in Orissa in 2008 was due to the conversion of Adhivasis and Gorkhas to the Christianity.¹⁷

4.Trivial Causes

Some of the trivial causes responsible for communal violence and disturbance are disputes such as over places of worship, clashing of times of prayers of different communities, disturbances in religious processions/functions, objection to playing of music, singing and dancing in front of mosque and other religious places, obstructions placed during religious processions, desecration or destruction of places of worship, reaction for religious conversions and vulgar display of religious fervors on the localities especially at the places inhabited by the members of the other community etc.

Other causes responsible for communal violence are dispute between property owners and tenants, distribution of objectionable pamphlets, due to the migrated Muslims and refugees, emotion and insecurity, laying the foundation for new statues, mischievous media reporting, objectionable speeches, pelting stones to disturb the religious processions, petty quarrels between members of different communities, personal quarrels, provocative and abusive slogans against the other community, publishing of provocative articles and objectionable writings, use of loudspeakers at religious places and other similar practices, no regulation on religious processions, existence of different disputes, lack of responsive and responsible behaviour by local administration and lack of coordination between the various administrative units on the spot, reaction and repercussion of riots of other places, i.e., Delhi riots of 1987 as a fall out of Meerut riots of 1987, road accident, traffic accidents, showing signs or symbols of insulting, sudden quarrel, taking out processions through unconventional and non-permitted routes

Some of the trivial causes responsible for communal violence and disturbance are festivals such as demarcating new places for Tazias, changing the route of processions, intolerance during fairs and festivals, performing Qurbani (i.e. sacrifice) in a public or open place, sacrificing of cow on 'Bakharid' (i.e. the festival of sacrifice), Cow slaughter, beef consumption, presence of objectionable animals at the time of prayers, , throwing of liquor and flesh of objectionable animals at religious places, throwing of colours, gulal, etc, on person who resent it and throwing of colours, gulal, etc, on mosque or other religious places.

Sexual offences such as marriage, harassment at workplace, eve-teasing and sexual relations between members of the opposite groups and cases of elopement etc. are some of the trivial causes responsible for communal violence.

.Conclusion

The problem of communal violence encompasses religious, political, socio-economic, cultural, historical and intellectual spheres in different ratios and extent with reference to different states and regions. After

partition of the country, communal violence is organized, planned and executed by the stakes for deriving selfish gains. In most cases, it is politically motivated and the role of rumours in rousing communal passions is quite famous. The communal atmosphere provides a ready-tilled soil for communal minded people to sow seeds of communal hatred and nurture them until the bitter harvest of communal violence is reaped. Efforts were made by the government to "appease" both Hindus and Muslims, which brought about disaster. Politicians have no interest in bridging the gap between communities, but have, in fact, a positive stake in ensuring that it remains as wide as possible. They succeed in misguiding their ignorant co-religionists in the wrong direction and towards the wrong goals, which are against the interests of the people themselves. The next decade would be one of blood and tears.. Communal violence are really unwelcome problem for any civilized and harmonious society.

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Review Article

Sex selective abortion - A Frightful Reality (Social – legal ramifications)

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Abstract

The Census of 2011 reported the most disturbing and alarming aspects of sharp fall in sex ratio of children. The Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 was enacted for the prohibition of sex selection, before or after conception and for regulation of Pre-Natal Diagnostic Technique for the purpose of detecting genetic abnormalities, metabolic disorders or chromosomal abnormalities and for the prevention of their misuse for sex determination leading to female foeticide. This indicates that mere enactment of Act is not enough. It needs involvement of people and serious efforts to implement legislation.

Keywords: PCPNDT Act, Female Foeticide, Social factors, Legal framework

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Introduction:

"Discrimination against girls anywhere in the world is a social ill and human rights violation, which must be stopped. Girls, like boys, deserve equal love, equal opportunity and equal rights"¹ Sex- selective abortion is a major social problem in Indian society. Practice of sex- selection prevail in India from the ancient time and continue till date and this leads to girls shortage in our society. Also, it doesn't matter if it's villages or metro cities or it's illiterate person or educated one because it's only a myth that, this practice is continued by only the poor and illiterate who are leading the way. "Sex selection starts with the urban, educated middle-class and filters down," adding that it seems paradoxical that educated women are more likely to abort a foetus that illiterate person are practicing foeticides.

Merely on the payment of Rs.100 or Rs.500 "traditional dais" who assist the child work till the female babies as the matter of routine the moment they are born. The heartless way in which this is done will make the "devil faint" knowingly that female foeticide is a crime as it amounts to murder and murderer are subjected to punishment under Section 300 of Indian Penal Code, 1860.²

Simply, sex selection is the practice of determining the sex of the unborn foetus developing in the mother's womb and eliminating it if found to be girl child. Sex Selection is not only about misuse of technology. At the heart of the matter, is the low status of women and girls, and the deep-rooted prejudices they face throughout life because the saying like "Investing in a daughter is like watering your neighbour's lawn" is shows the mental status of the society, this attitude towards girls need to be changed.³ The issue needs to be seen in the context of a male-dominated social and family structure and a value system based on son preference. Further, the practice of dowry carries the tag with a girl that she is

a *parayadhan* and the result of this is that the parents feel that the boy is a help for the future, where the girl is a liability. "If we spend money on her, then we have to spend money on her marriage, dowry probably, and then if something goes wrong, then we are always sufferers. So better that girl is not to be born." Discrimination and neglect of the girl child could be in terms of inadequate nutrition, denial or limited access to education and health, and domestic violence. In one of its worst forms, it leads to complete rejection of daughters even before birth, as practiced through sex selection.

A male child is considered to be a producer, whereas a female child is considered to be a consumer. All this is mainly due to the patriarchal form of the Indian society. In Sanskrit language there is a saying that *Yatra Naryastu Pujyante, Ramante Tatra Devtāit* means where woman are worshiped, God resides, but in present time woman are exploited every time, they get abused in houses and subject to harassment at their workplace and female child are aborted in hospitals by the qualified doctors who are recognize as a God in our society.

It is the most prominent practice in Gujarat and the North Indian states, which according to census data have an alarmingly low ratio of female children. There are certain castes which regularly practiced the female foeticide and later female infanticide.

Female foeticide: It is the elimination of a female foetus at any stage of pregnancy, after determining its sex. It is also defined as killing of female foetus through induced abortion.

Female Infanticide: Means intentionally killing of a baby girl after her birth due to the preference to the male babies by an act of omission or commission.

Definitions of Sex- Selection

According to Section 2(o) of the PCPNDT Act, 1994 "sex selection" includes any procedure, technique, test or administration or prescription or

provision of anything for the purpose of ensuring or increasing the probability that an embryo will be of a particular sex. This Act permit the sex selection in certain condition and permit use of such techniques provided that the medical practitioner has explained all the known side effects and after effects of such techniques to the pregnant women.

SOCIAL CAUSES FOR FEMALE FOETICIDE

1. Low Status of Women in society:

I'm not a rabid feminist who would shout herself hoarse about the domination of men in any society. Sure, males are the stronger sex when it comes to the pecking order in a country, but that does not entail a curbing of rights for women. Rather than whining about the denied opportunities, women should stand up and try to grasp the chances they want for themselves.

However, this Utopian scenario is not quite easily achieved in practice. Centuries of repression has made inferiority second nature to most women. They willingly embrace the role of the meek, submissive, docile wife who works relentlessly to cater to the whims of her husband. The worst enemy of a woman is the woman herself. Female foeticide happens with the explicit consent of the mother. While most mothers-to-be agree to this misdeed out of a sense of duty to the family, there are many who take the initiative themselves.

2. Dowry system

In India, the age old custom of dowry system puts a damper on the parents' spirits who are 'blessed' with a girl child. Right then and there, begin the calculations associated with marriage expenses, which may happen after a couple of decades, following the child's first breath. A lump sum paid to the daughter in twenty years when the currency value may depreciate and inflation may skyrocket is seen as a tragedy waiting to happen. It would be so much better to get rid of them with just a fraction of the amount.

3. Insult for not having a male child:

The desire of a male child is a curse for a woman. After getting married if the woman is unable to give birth to baby boy and continuously she is giving birth to a female child then the status of woman gets decline in the eye of the family of in-laws and even husband criticize and humiliate the woman, knowing that it's not in the hand of the woman. Not only this, but the people have crossed all the boundaries just to get a male child to proceed his generation, that the Madhya Pradesh High Court said that it is unbelievable that so many time husbands are ready to marry with another woman[4] and don't bother about the rights of the first wife and children. Sometimes the torture and humiliation is so extreme that the woman is on the urge of committing suicide.

4. Desire of a male child:

Elimination and removal of girls from the family tree even before they are born clearly indicates the passionate desire for a boy child. In the countries where female foeticide has become unbridled, the core

factor is the need to continue the family line through the male born into it. Sons are seen as the main source of income. Even today women can easily rub shoulders with men, almost in every field but the common misconception still remains that it is the male who will help to run the house, and look after his parents. Once married, women are like cargo, ready to be shipped off to another household, while parents breathe a sigh of relief for a job well done in getting their 'daughter' settled.

5. Foul Medical Ethics:

The opening conversation to this hub satisfactorily covers this point. With the legalization of abortion in India, illegal sex determination and termination of pregnancies has become an everyday reality. The professionals in the medical field are only too glad to help parents realize their dream of a healthy baby boy. Female foeticide is openly discussed amongst many in the healing fraternity and even pin boards outside certain clinics read, '**Pay Rs.500 (\$ 10) today to save the expense of Rs. 500 000 (\$ 10 000) in the future**'. The initial meager sum is the cost of a pregnancy termination, while the bigger amount specified in comparison, is the expense that the family will be burdened with in the form of dowry for the girl.

6. Technology Growth and Advancement:

Industrialization of the health sector has further strengthened the selective sex abortion quarter. With the advent of **amniocentesis and Ultrasound**, sex determination of the foetus has become much easier than it was earlier. This goes on to show how the manufacturers of high-tech equipments and gadgets, used to run these tests, benefit from the woes of future parents and their unborn child. Many hospitals are known to sign long term contracts with the firms involved in the production of these types of medical machinery. Often, a healthy percentage of the profit is shared with the hospital and both parties enjoy the fruits of rewarding a death sentence. As opposed to amniocentesis, the ultrasound technology is cheaper and within easy reach of the lower economically backward strata of society. It is also easily accessible in a hospital/clinic nearby with Medicare credentials.

LEGAL FRAMEWORK FOR ABORTION

1. Indian Penal Code, 1860

Causing Miscarriage- Whoever voluntarily causes a woman with child to miscarry, shall, if such miscarriage be not caused in good faith for the purpose of saving the life of the woman, be punished with imprisonment of either description for a term which may extend to three years, or with fine, or with both; and, if the woman be quick with child, shall be punished with imprisonment of either description for a term which may extend to seven years, and shall also be liable to fine. ⁵

Causing Miscarriage without Woman's Consent- Whoever commits the offence defined in the last preceding section without the consent of the woman, whether the woman is quick with child or not, shall be punished with imprisonment for life, or with

imprisonment of either description for a term which may extend to ten years, and shall also be liable to fine.⁶

Death caused by act done with intent to cause miscarriage -Whoever, with intent to cause the miscarriage of a woman with child, does any act which causes the death of such woman, shall be punished with imprisonment of either description for a term may extend to ten years, and shall also be liable to fine and if the act is done without the consent of the woman, shall be punished either with imprisonment for life, or with the punishment above mentioned.⁷

Act done with intent to prevent child being born alive or to cause it to die after birth- Whoever before the birth of any child does any act with the intention of thereby preventing that child from being born alive or causing it to die after its birth, and does by such act prevent that child from being born alive, or causes it to die after its birth, shall, if such act be not caused in good faith for the purpose of saving the life of the mother, be punished with imprisonment of either description for a term which may extend to ten years, or with fine, or with both.⁸

Causing death of quick unborn child by act amounting to culpable homicide- Whoever does any act under such circumstances, that if he thereby caused death he would be guilty of culpable homicide, and does by such act cause the death of a quick unborn child, shall be punished with imprisonment of either description for a term which may extend to ten years, and shall also be liable to fine.⁹

2. Medical Termination of Pregnancy Act, 1971

The MTP Act legalize abortion only when there is some kind of risk to the female's life or a grave injury to her physical or mental health but not to legalize the illegal abortion with the intension to commit the act of female foeticide through pre-natal determination.

This abortion can only be performed by a registered medical practitioner when pregnancy does not exceed not 12 weeks. But if is over 12 weeks and within 20 weeks, then it is performed by two registered medical practitioners in a government hospital, nursing homes, centers approved by the Directorate of Health Services (DHS), or by Chief Medical Officer (CMO) of District.¹⁰

It is duty of the doctor to be satisfied that there are justifiable grounds for the operation.

When a woman can abort:

Following conditions are mentioned in the law when a pregnant woman can get herself aborted.

1. When the continuation of pregnancy endangers for the life of women or may cause grave injury to her physical or mental health.
2. When economic & social environment is not suitable for continuation of pregnancy.
3. In rape cases, a woman can also abort the child, if she doesn't want that baby.
4. When any child suffer from physical or mental abnormalities as to be seriously handicapped (e.g. congenital defects, etc.)

5. When pregnant woman is not mentally sound than written consent of the guardian in necessary for abortion of such women.

3. The Pre-conception and pre-natal diagnostic Technique (Prohibition of sex selection) Act, 1994

The main object of this Act is prohibition of sex selection, before and after conception and regulation of prenatal diagnostic techniques (e.g., amniocentesis and ultrasonography) for the detection of genetic abnormalities, by restricting their use to only registered institutions.

Initially, this Act called as Pre-Natal Diagnostic Techniques (Regulation and prevention of Misuse) Act, 1994. Later on the amended in 2002 and renamed as Pre-conception and pre-natal diagnostic (Prohibition of sex selection) Act, 2002 which came enforce in 2003 with the objective as stated in the preamble;

Salient features of the Act:

- Absolute prohibition of sex selection and sex determination.
- Regulation of the use of prenatal diagnostic techniques (e.g. amniocentesis and ultrasonography).
 - I. These can only be conducted for specified conditions, such as the detection of specific abnormalities in the foetus.
 - II. All clinics, hospitals, nursing homes and laboratories conducting these tests and ultrasound must be registered under the PCPNDT Act 2003 by paying a fee. A copy of the registration certificate must be prominently displayed by the clinic. Detailed patient records as per specified formats have to be maintained.
 - III. Only qualified doctors under the Act (MD in Medicine, Gynecologists, Pediatricians and Medical Geneticist) can conduct these diagnostic techniques including ultrasonography.
- No person conducting pre-natal diagnostic procedures shall communicate to the pregnant woman concerned or her relatives the sex of the foetus by words, signs or in any other manner.
- Advertising of sex determination tests in any form is prohibited.
- The sale of ultrasound machines to persons not registered under this Act is prohibited.
- Any person violating these provisions is liable to be punished under the Act.

Prohibition of sex-selection-No person, including a specialist or a team of specialists in the field of infertility, shall conduct or cause to be conducted or aid in conducting by himself or by any other person, sex selection on a woman or a man or on both or on any tissue, embryo, conceptus, fluid or gametes derived from either or both of them. ¹¹

Prohibition on sale of ultrasound machines, etc., to persons, laboratories, clinics, etc. not registered under the Act.- No person shall sell any ultrasound machine or imaging machine or scanner or any other equipment capable of detecting sex of foetus to any Genetic Counselling Centre, Genetic Laboratory, Genetic Clinic or any other person not registered under the Act. ¹²

Sex Determination Prohibition - After the commencement of the PCPNDT Act, there are certain guidelines for the Sex Determination which are as under -

(a) No Genetic Counselling Centre or Genetic Laboratory or Genetic Clinic shall conduct or cause to be conducted in its Centre, Laboratory or Clinic, pre-natal diagnostic techniques including ultrasonography, for the purpose of determining the sex of a foetus;

(b) No person shall conduct or cause to be conducted any pre-natal diagnostic techniques including ultrasonography for the purpose of determining the sex of a foetus;

(c) No person shall, by whatever means, cause or allow to be caused selection of sex before or after conception.

As we know that Pre-natal literally means before birth. Legally, tests can be used to detect physical and mental abnormalities in a fetus and are known as pre-natal diagnostic techniques. These techniques include the study of blood, body fluid (e.g. Amniocentesis), cells and tissue (e.g. Chorionic villi biopsy) taken from a pregnant woman or the foetus.

These tests are used on pregnant women when there is:

1. History of the woman concerned of giving birth to children having physical and mental abnormalities
2. Hereditary forms of anemia, mental retardation and mental illnesses in the family
3. History of stillborn births
4. Pregnant woman's exposure to chemicals, drugs, radiation etc that are known to cause birth defects
5. Pregnant women above the age of 35 years.
6. Different blood groupings of the foetus and mother.

The doctor carrying out the tests has to take written consent of the pregnant woman informing her about the side effects of the tests. A copy of the consent obtained must be given to the woman. This has to be done in a local language that she understands. The other technique is ultrasonography. It is used to monitor the growth of the foetus as part of ante-natal check-up. None of these tests can be used to determine the sex of the foetus. Every offence under

this Act shall be cognizable, nonbailable and non-compoundable.[13]

Punishment for Violation of the Act:

1. For a doctor or medical person who misuses these techniques for sex selection:
 - 3 years imprisonment and/or fine up to Rs 10,000 for first conviction. Suspension of Registration by the Medical Council for 5 years for first offence.
 - For subsequent offence, 5 years imprisonment and/or fine Rs 50,000. Permanent removal for subsequent breaches.
2. Persons seeking to know the sex of the foetus:
 - 3 years imprisonment and/or fine Rs 50,000 for the first offence
 - For subsequent offence, 5 years imprisonment and/or fine Rs 1,00,000. The pregnant woman herself is considered innocent under the Act, unless and until proved otherwise. It is presumed that she will have been compelled to undergo sex determination tests by her husband and relatives
3. Persons connected with advertising of sex selection/ sex determination services:
 - 3 years imprisonment and/or a fine of Rs 10,000 with additional fine for continuing contravention at the rate of Rs 500 per day

Suggestions

In the light of the above discussion the researchers want to give some suggestions to eradicate the problem of female feticide:

- Pre Conception and Pre Natal Diagnostic Technique Act, 1994 to be publicized among doctors and public at large.
- Permanent termination and cancellation of the doctor's license who take part in fulfilling a client's demand through female foeticide.
- Heavy penalty imposed on companies, which specialize in marketing medical equipments used for illegal sex determination and abortion in unlicensed clinics and hospitals.
- Provisions made for high fines for those doctors and parents who are involving in female foeticide.

- An action against must be taken against those 'parents' who knowingly try to kill their unborn child.
- Spreading awareness through campaigns, seminars and workshops which can contribute a way long in saving our future sisters, mothers, girlfriends and wives because ignorance is one of the major causes for the increase in the selective sex abortion cases.
- Amend the existing laws that have a gender bias so that the myth of male superiority can be exploded.

Conclusion

Right to life is a basic human right and also a fundamental right under Constitution of India. No one can take this right without any reasonable ground which is defined under the laws whether he is doctor or parents of any infant. Technology advancement is the main cause of this problem. We invent a new technology for the betterment of the society but people start to do the misuse of technology and when the misuse of any technology has been started, it's become a curse for humanity and the result of this is we face the problem of girls shortage in present time in form of female foeticide and female infanticide .

To eradicate the problem of female foeticide, women empowerment is necessary in an economic or political area and promotion of gender sensitive health education. The main reason behind this problem is the structure of the society because our society is male dominant society and women are subject to violence within the house or outside the house. The attitude of society towards girls need to be change because they are also the big part of Indian population and we cannot deny the importance of the girls in our life.

"When girls go missing in a society, When a child is denied the right to life even before birth only because of she is girl, The discrimination starts when child is in the womb and continues throughout her life till the grave, When a girl child is denied her basic right to survive, develop, participate and protect, It becomes an issue of paramount concern and urgent action [14]

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Secondly.—If it is done with the intention of causing such bodily injury as the offender knows to be likely to cause the death of the person to whom the harm is caused, or—
Thirdly.—If it is done with the intention of causing bodily injury to any person and the bodily injury intended to be inflicted is sufficient in the ordinary course of nature to cause death, or—
Fourthly.—If the person committing the act knows that it is so imminently dangerous that it must, in all probability, cause death or such bodily injury as is likely to cause death, and commits such act without any excuse for incurring the risk of causing death or such injury as aforesaid
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<i>Original study</i>

Socio-demographic characteristics and Occupational Status with Morbidity profile of workers in small scale textile industries in Meerut District

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Abstract

Background: Throughout the world, work related injuries continue to cause serious public health problems and are leading cause of death, disability and disease. In developing countries including India, the risk of having work related injury is 10 to 20 times higher than that of developed countries. **Objectives:** (1) To know the socio demographic status of textile workers in the small scale industries Meerut (2) To assess the morbidity disorders among textile workers in the small scale industries in Meerut **Materials and Methods:** This community based, cross-sectional study was conducted among the textile workers of small scale industries of Meerut. 206 workers were randomly selected. The subjects were then interviewed by using a pre-designed, pre-tested semi-structured interview schedule. Interviews were conducted during home visits in Hindi/local language from July 2012 to December 2012. Health status was assessed by asking questions regarding their health problems (in the past three month period) followed by clinical examination by a physician. At least two home visits were undertaken before indicating that a worker was not available. The interview took approximately 25 - 30 minutes to complete the schedule. **Statistical Analysis:** Data was compiled and analyzed using Microsoft Excel and the results were expressed as proportions. **Result:** Most of the workers were males 193 (93.68) were in the 15-45 years age-group 162(78.64%). 151 (73.30) of the workers were illiterate and most of them belonged to lower middle class 165 (18.93%) 165 (80.10%) of the workers were addicted to one or more substances i.e. smoking, and tobacco chewing and both. Musculoskeletal problems 141 (68.44%) were the commonest health problem. The other morbidities that we detected were respiratory illness 32(15.53%), and other general diseases such as weakness, anxiety, gastritis, hearing loss and eye problem were found 33(16.00%) **Conclusion:** This study suggested that work related musculoskeletal disorders was found among small scale textile industrial workers. Improve there socio economic status, counseling should be given for addiction and health education should be provided.

Key Words: Textile workers, Occupational health status, Addiction.

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Introduction

The textile industries are the largest economic sector; nearly 3.8 million handlooms provide employment to 6.5 million workers, who are engaged in producing natural fiber fabrics like cotton, silk and woolen, as well as man-made and mixed fiber fabrics. Weaving processes are done on two types of hand operated looms e.g., (i) desk-bench type workstation and (ii) sitting on floor with their legs hanging to operate the pedals at a lower level. . The task of weaving demands repeated movement of upper and lower limbs to operate pedals and shuttles, with arms raised away from the body.

Weaving in textile units involves working with warping and weaving machines. The workers are exposed to vibration, cotton dust and noise.

Standing work posture is maintained throughout the shift in operating power loom looms simultaneously. After raw materials are warped, the workers push and move iron beams weighing 75–100 kg for a distance of about 2 m and this kind of materials handling are performed 6–7 times per day. The job demands high attention in observing threads do not break off, mending the breaks and then change the beam after one is completed.¹

The working environment and living conditions of the textile workers are poor and pathetic and even hazardous to their health. They often do not have proper housing, ventilation, sanitation, water supply, proper electricity, natural and artificial lighting in working environment. There is no compensation for work stoppages by the employers. Many workers are Muslim by religion and weavers by caste. The textile work is a family

affairs occupation and it is based on home industry. Women and children are involved as co-supportive in weaving.

Textile workers suffer many serious illnesses such as respiratory problems, musculoskeletal problems, mental disorders, stress, eye diseases, skin problem, gastritis and injuries. The ill health is compounded by various socio-economic factors such as poverty, lack of education, poor diet, addictions, poor working condition, excess working hours etc.²

We conducted this study among textile workers in the small scale textile industries in Meerut District. We had the following objectives:

(1) To know the socio demographic status of textile workers in the small scale industries Meerut

(2) To assess the morbidity disorders among textile workers in the small scale industries Meerut

Material and Methods

This community based, cross-sectional study was conducted among the textile workers of small scale industries of Meerut. 206 workers were randomly selected. The subjects were then interviewed by using a pre-designed, pre-tested semi-structured interview schedule. Interviews were conducted during home visits in Hindi/local language from July 2012 to December 2012.

Written informed consent was obtained after explaining clearly the purpose of the study. Information was sought on socio-demographic profile, addictions, health status. Health status was assessed by asking questions regarding their health problems (in the past three month period) followed by clinical examination by a physician. At least two home visits were undertaken before indicating that a worker was not available. The interview took approximately 25 - 30 minutes to complete the schedule. Data was compiled and analyzed using Microsoft Excel and the results were expressed as proportions.

Results:

The socio demographic profile of the study population shows that most of the workers were males 193 (93.68) and they were in the 15-45 years age-group 162 (78.64%). It was found that 151 (73.30) of the workers were illiterate and most of them belonged to lower middle class 165 (18.93%) socioeconomic status according to modification Kuppaswami Classification 2012. 165 (80.10%) of the workers were addicted to one or more substances i.e. smoking, and tobacco chewing and both.

Table 1: Socio-demographic characteristics of textile workers.

Characteristics		Power Loom Workers (n=150)	Handloom Workers (n=56)	Total Workers n=206)
Age	< 45 years	117 (78.00)	45 (80.35)	162 (78.64)
	≥ 45 years	33 (22.00)	11 (19.65)	44 (21.36)
Gender	Male	150 (100)	43 (76.78)	193 (93.68)
	Female	0 (00.00)	13 (23.22)	13 (06.32)
Religion	Hindu	12 (08.00)	07 (12.50)	19 (09.23)
	Muslim	138 (92.00)	49 (87.50)	187 (90.77)
Marital Status	Married	129 (86.00)	50 (89.50)	179 (86.90)
	Unmarried	21 (14.00)	06 (10.72)	27 (13.10)
Education	Illiterate	108 (7.002)	43 (76.78)	151 (73.30)
	Literate	42 (28.00)	13 (23.22)	55 (26.70)
Socio-economic status	Lower Middle	30 (20.00)	09 (16.07)	39 (18.93)
	Upper Lower	120 (80.00)	47 (83.93)	167 (81.07)
History of Smoking				
	Present	117 (78.00)	48 (85.72)	165 (80.10)
	Absent	33 (22.00)	08 (14.28)	41 (19.90)

Musculoskeletal problems 141 (68.44%) were the commonest health problem. The other morbidities that we detected were respiratory illness 32(15.53%), and other common general diseases were found 33(16.00)

Table 2: Occupational Status and Morbidity profile of textile workers.

Occupational Status		Power Loom Workers (n=150)	Handloom Workers (n=56)	Total Workers n=206
Years of working				
	Less than 5 years	26 (17.33)	11 (19.64)	29 (14.07)
	5-10 years	40 (26.66)	20 (35.71)	51 (24.75)
	More than 10 Years	84 (56.00)	26 (44.64)	109 (52.91)
Hours of works / per day				
	Less than 8 hrs	22 (14.66)	10 (17.85)	32 (15.53)
	5-10 hrs	36 (24.00)	10 (17.85)	56 (27.18)
	More than 10 hrs	92 (61.33)	20 (35.71)	118 (57.28)
Morbidity profile				
	Musculoskeletal disorders	105 (70.00)	36 (64.28)	141 (68.44)
	Respiratory illness	20 (13.33)	12 (21.42)	32 (15.32)
	Others	25 (16.66)	08 (14.28)	33 (16.01)

Discussion and Recommendations:

The 'textile' industry of India is one such industry. It is an unorganized sector, mostly run by private establishments. The employees of this industry hardly ever benefit from occupational health-and-safety provisions. In India, there is a lack of awareness about occupational safety and environmental hazards that severely affect the vulnerable and marginalized working population. According to WHO, over 1000 million people

worldwide are employed in small scale industries.³

In this study (80.10%) workers were addicted to one or more substances i.e. smoking, and tobacco chewing or both. Similar findings were observed in a study conducted by Zaki A et al (2010) who suggested that the overall prevalence of tobacco use was 85.9% and prevalence of smoking was 62.28% among the power loom workers.⁴

The reasons of tobacco consumption may be low educational status, occupation involving hard labour work doing night shift and low socioeconomic status. The ill health is compounded by various socioeconomic factors such as poverty, lack of education, poor working conditions, excess working hours, and poor diet.⁵

In this study we found that musculoskeletal problems 141 (68.44%) were the commonest health problem. Several work place factors, such as repetitive work, awkward and static postures, have been identified as being associated with upper extremity pain and discomfort.⁶ Work-related musculoskeletal disorders (WMSDs) have emerged as major health problem among workers in both industrialized and industrially developing countries. ⁷In a study by Saha TK et al, musculoskeletal problems (69.64%) were the commonest problem.⁸ Studies in Iranian hand woven carpet industry have reported high prevalence of musculoskeletal problem among weavers due to constraints of working postures, poor design of loom, working time, repetitive work and seat type. ⁹ In another study done by How-Ran Guo, workers complained of musculoskeletal disorders of mainly neck, back, shoulders, hands, and wrists.¹⁰

Musculoskeletal problems were the commonest health problem detected in this study population. This may be explained by the fact that their work required them to remain in a bent position for many hours at a stretch, often in an overcrowded, ill-ventilated, and poorly illuminated room. The neck was the commonest anatomical area to be affected.

In machine manufacturing plant and textile weaver's high physical demands, poor postures and insufficient recovery time are the contributing factors to develop low back pain. In spite of apparently similar occupational pattern of work, gender differences do exist in the prevalence and severity of MSDs and perception of work as stressors.¹¹

In recent times, the contribution of poor environmental conditions at the workplace, poor perception of work conditions, and presence of

adverse health conditions in workers has received much attention. The nature of workplaces varies and therefore the determinants of occupational injury and morbidity also varies; identification of the responsible factors in any specific work environment would help in clarifying the etiology and would also be useful for prevention and containment of occupation-related ill health.¹²

In this cross sectional study, the associations presented are observed relations. Reports from Thailand and India confirm the prevalence of MSDs among weavers but the back pain observed in the study. Forced back bent sitting work posture due to positioning of loom; workspace constraints, high muscle exertion and repetitive movement of limbs to operate the looms might be attributed to high prevalence of MSDs among handloom weavers in the present study.^{13,14}

High prevalence of back and knee pain among the female weavers in handloom (fixed work station) might be due to the fact that either they had to stretch their legs maximally or had to sit with minimal hip support in a constrained posture to operate the pedals. Non-adjustability of workstations of the looms had distinct constraints on workers due to anthropometrics and physiologic characteristics and contributed to the MSDs.

Standing for long hours influences centre of pressure points of the body and lumbar extensor muscle fatigue suggesting that the occurrence of pain in knees among workers might attribute to their standing work for long hours. To these poor workers, mitigation of pain is not their priority. Often they take it for granted as the part of their life process and avoid spending money for medication for themselves in the face of other family priorities. This indifferent attitude often makes the situation aggravated in terms of overuse of muscle and tendons without being recovered. The workers' chosen perception, like constrained work posture, work equipment/tools/method and work load, as the causes of pain and discomfort signify the necessity of involving workers' representation while taking into account the intervention measures to minimize the MSDs among weavers in handloom and powerloom sector. A study reports and substantiates the risk of developing MSDs among weavers who had poor job satisfaction and poor job autonomy. Psychosocial characteristics might also influence biomechanical strain, through changes in posture, movement and exerted forces.¹⁵ Association may well be confounded by the effect of physical factors at work.¹⁶

In this study the other morbidities that we detected were respiratory illness 32(15.53%), In

a study by Parimalam P et al. reported high rate of prevalence of breathing difficulty (82%) and 22% of the workers in the cutting section suffered from asthma.¹⁷

Respiratory problems were the commonest health problem detected in this study population. This may be explained by the fact that they were working in an ill ventilated, overcrowded and poorly illuminated room. Periods of rest in between their long hours of work and seats with adjustable backrest that provide support for the lumbar region would go a long way to reduce postural strain and low back pain. Mismatch between man and machine is one of the major factors contributing to musculoskeletal problems. This may be mainly due to the attempts made by the workers to fit the man to the job rather than to fit the job to the man.

The variety of morbidities detected among weaving workers, especially the high prevalence of musculoskeletal problems, is alarming. It is high time that steps are taken for revising their wages and the other conditions related to their jobs so that they can improve their socioeconomic condition. Counseling for alcohol and tobacco addiction is necessary and they must be educated regarding the prevention of common diseases and the importance of personal hygiene. Periods of rest in between their long hours of work and seats with adjustable backrests that provide support for the lumbar region would go a long way to reduce postural strain and low back pain. The responsibility for improving the health and safety conditions of garment workers lies with the government and nongovernmental agencies as well as the employers. We recommend that studies with larger sample size should be undertaken to confirm the findings of this study.

Textile workers were mainly suffering from respiratory, musculo-skeletal, physical injuries, mental stress, GIT and skin disorders. Immediate intervention programmes are warranted to reduce the future burden of tobacco use related morbidities among the textile workers. Counseling for tobacco addiction is necessary and they must be educated regarding the prevention of common diseases and the importance of personal hygiene.

Exhaust systems should be provided for textile workers which ensure proper ventilation and regular supply of fresh air in group work spaces.

In textile industry, several hazardous conditions exist, which synergistically affects the health and comfort of the workers ultimately decreasing the work efficiency and hence productivity. It is necessary to monitor the occupational environment and health status of the workers

periodically. It is also necessary to create awareness regarding the ill effects of industrial hazards. Awareness generation and updated information regarding the traditional medicines should be undertaken for workers. Periods of rest in between their long hours of work and seats with adjustable backrests that provide support for the lumbar region would go a long way to reduce postural strain and low back pain. The responsibility for improving the health and safety conditions of textile workers lies with the government and nongovernmental agencies as well as the employers. We recommend that studies with larger sample size should be undertaken to confirm the findings of this study.

Lack of general safety measures like absence of first aid kits and lack of safety devices like fire extinguishers, alarms and emergency exits were other serious deficiencies in the workplace. Lack of these safety devices results in the workers getting trapped inside the units under emergency situations. Every work place should have at least the minimum first aid facilities and access to trained personnel to provide emergency medical care. First aid facilities and trained personnel are important components of health and safety arrangements. Safety measures should be checked periodically for ensuring their utility during emergency situations. Use of personnel protective equipments (PPE) like masks or respirators with mechanical filters or with oxygen or air supply, ear plugs, earmuffs should be made mandatory wherever threat to workers health and safety is anticipated. All workers using PPE should be trained in their use and maintenance. All workers must be given periodic medical examination.¹⁸

Conclusion

This study found work related musculoskeletal disorders and respiratory problems due to addictions among small scale textile industries workers. Their socio economic status should be improved and counseling should be provided for addictions and education related occupational health. Regular breaks in between work hours and rotation of jobs so that exposed workers are able to reduce the duration and intensity of their exposure. Regular medical check-ups at periodic intervals at the workplace with increased emphasis on preventing health problems rather than curing them.

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Original study

Crime Of Aggression: Decoding The Dilemma Of Aggression Laws

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Abstract

In International Law there are few issues that are crucial and sensitive, out of which the crime of aggression is emerging as a challenge. Aggression in its essence has been defined as state conduct that either initiates war or brings about a situation in which the victim is (or may be) driven to war. From Rome Statute 1998 till Kampala conference 2010, the crime of aggression has evolved into various dimensions. Though the amendments passed at the Kampala Review Conference is a milestone in the development of the aggression related laws, there still lies the need to unveil some complicated issues related to its enforcement, influenced dispute settlement mechanism and ambiguity. This attempt of internationally researched work piece seeks to knock the doors of the meaning and relevancy of crime of aggression in brief. The history and development of crime of aggression has also been traced. It ushers the threshold issue of jurisdiction in prosecuting the aggressor state. The present work advocates universal jurisdiction in trying crime of aggression with special reference of Nuremberg Trial. It also seeks to examine the aggression demonstrated by powerful states in the name of humanitarian intervention. Lastly, overall recommendations are advanced that tends to lead the human kind to a nonpartisan global village.

Keywords: Aggression, interventions, jurisdiction.

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Introduction

Crime is as old as the inception of human being and has been observed in different facets both in pragmatic and modern society. With the passage of globalization, crime has taken a trans-national shape and a new dimension of crime in form of crime of aggression has emerged. Aggression is that irresistible natural phenomenon which acts as a channel for a human to express his inner fury to the outside world. Since the ages unknown, aggression has not been an insuppressible part of human nature only, but as suggested by many texts¹, it was common to gods as well. Gradually arriving till this very century, the concept of Aggression has acquired different dimensions. Demonstration of aggression by one state over the other has been categorized as an International Crime by the *Rome Statute*¹ under Article-5.1². However many pitfalls in its legislation has created a situation of ambiguity and chaos.

Struggle for defining Aggression

Defining aggression in a single thread has been an arduous task due to its diversified possible interpretations. Although criticized, an alternative approach was to leave 'aggression' undefined;

meaning its identification remained completely at the discretion of the Security Council.³

It was under *Rome Statute 1998* that, after enormous efforts the crime of Aggression has been defined as, "the crime of planning, initiation or execution of an act of aggression by a person in a position to exercise control over the political or military action of a State where the character, gravity and scale of such an act of aggression constitutes a manifest violation of the Charter of the United States". However, the definition was considered as the 'best possible compromise' reached, out of many made under the Statute, but still it is inaccurate, unclear and not exhaustive to deal with the acts of aggression, for example, the word 'manifest' suggests a vague idea about the degree of an act. It is unclear if it means a violation with serious consequences or should it be left completely over the discretion of judiciary?

Evolving Impunity for Aggression: since Rome to Kampala

The next major issue left undecided by the *Rome Statute* was about the exercise of jurisdiction as tribunals established by the Security Council did not provide jurisdiction over this crime. The decision to exclude aggression reflected the drafters' recognition

that aggression is a different species of offence as it is based on *jus ad bellum*, addressing the legality of the war, whereas the crimes within the tribunals' jurisdiction are based on *jus in bello*, aiming at the legality of the conduct of war.⁴

Moreover, the members of the Security Council view jurisdiction over aggression as antithetical to their interests, since they themselves were constantly being accused of having committed acts of aggression throughout the world.⁵ Therefore, it emerged as the cause of 'impunity' for the Crime of Aggression.

After the Kampala Conference 2010 the jurisdiction has been vested in ICC. Art. 15*bis* deals with referrals by State parties and *proprio motu* prosecutions by the Prosecutor and Art. 15*ter* deals with Security Council referrals. Art. 15*bis* was a more controversial provision. Despite of the fact, it was agreed that referrals by State parties and *proprio motu* prosecutors can take place without a Security Council filter but the Security Council can defer a prosecution under Art. 16.⁶ Therefore the situation still remains the same and it again renders the absolute power to the Security Council.

Universal Jurisdiction v ICC Jurisdiction

In 2010 in Kampala, many of the state parties agreed to amend the ICC Statute to add the crime of aggression to the Court's jurisdiction since there already existed a precedent established by the Nuremberg Trial, which declared aggression as a universal jurisdiction crime under. In spite of this, the majority did not opt for this and preferred the jurisdiction of ICC.

Therefore, the following questions arise; if the States already had the authority to try the cases of aggression then why there was a need to grant that Jurisdiction to ICC? Was there any personal interest on part of the powerful States like U.S.A and U.S.S.R. in order to escape their liability, who were themselves involved in the crime of Aggression, like the 2008 Russian invasion of Iraq, 2003 US invasion of Iraq, 2001 NATO invasion of Afghanistan, 1999 NATO bombings in Serbia etc.?

Rationale in favor of Universal Jurisdiction

The Preamble of the ICC Statute recalls, the so-called 'Complementarity Principle' which states that the ICC is to be a court of last resort, exercising its jurisdiction only when domestic courts are unable or unwilling to prosecute.⁷ And trials of World War II based on this type of jurisdiction have taken place in International Tribunals at Nuremberg and Tokyo, as well as in domestic courts. For example, Israel tried *Adolph*

*Eichmann*⁸ in 1961 and *John Demjanjuk*⁹ in 1988 for Nazi atrocities. It is pertinent to note here that the International Court of Justice and several domestic courts have also cited the General Assembly Resolution affirming the principles of the *Nuremberg Charter* and judgments as an authoritative declaration of customary international law.

Referring the General Assembly Resolution 95 (I), the Israeli Supreme Court stated in the 1962 *Eichmann case* that "if fifty-eight state unanimously agree on a statement of existing law, it would seem that such a declaration would be all but conclusive evidence of such a rule, and agreement by a large majority would have great value in determining what is existing law" and even High Court of Justice of England and Wales confirmed the same.¹⁰

Questioning the validity of Nuremberg Trial

There were also some criticisms regarding it too which included calling the Tribunal as a court of the occupying powers applying the territorial jurisdiction of Germany over the accused Nazis. Yet, there are several reasons to conclude that the better view was that Nuremberg was an international tribunal applying universal jurisdiction.

To begin with, in Article on the Nuremberg tribunal, Professor Egon Schwelb listed the features that evince that the Nuremberg tribunal was not a mere occupation court, but rather an international judicial body applying universal jurisdiction over the axis country war criminals.¹¹ Moreover, it is telling that the opening statements of both the U.S. Prosecutor Robert Jackson¹² and U.K. Prosecutor Sir Hartley Shawcross¹³ drew an analogy between the right to prosecute pirates¹⁴ under universal jurisdiction (Piracy was the first widely accepted crime of universal jurisdiction and for more than three centuries, states have exercised jurisdiction over piratical acts on the high seas, "even when neither the pirates nor their victims were nationals of the prosecuting state") and the legitimacy of the Nuremberg Tribunal's exercise of jurisdiction over the crime of aggression. Like piracy, the Nazi offenses during the war involved heinous atrocities, and were typically committed in locations where they would not be punished through other bases of jurisdiction.

Fifty years later, in its Report to the Security Council, the U.N. Commission of Experts on Violations of International Humanitarian Law in the former Yugoslavia reaffirmed the United States' view that Nuremberg had applied universal jurisdiction delegated by the states who were parties to the London Agreement.¹⁵

Although, there are a few drawbacks inherent in prosecuting aggression in national courts under

universal jurisdiction like such prosecutions may be so politically sensitive that they cannot be tried fairly and the attempt to do so would undermine efforts at maintaining inter stately peace¹⁶ etc. Still it is submitted that, universal jurisdiction should be preferred since if we compare both the options then we would be able to find out that universal jurisdiction guarantees the right to the States to try their culprits as has been accepted in other international crimes.

Humanitarian Intervention: a Legalized Aggression

Another important facet in the Crime of Aggression is the tactic of 'Intervention' as a preventive measure under the supervision of Security Council, which again is an indication of dominance of Security Council. It gives a view as if the winds of war and peace flow according to the pleasure of five great powers and also suggests the phenomenon of 'developed country chauvinism', ignoring the fact that humanitarian intervention involves the use of armed force, therefore is inconsistent with the UN Charter which states: "*the State that has engaged in humanitarian intervention has itself engaged in an act of aggression*"¹⁷

The 1990s was a 'decade of humanitarian intervention', during which the UN authorized several interventions on humanitarian grounds.¹⁸ During the 1990s, the United States and its allies took military action on at least three occasions, for express humanitarian purposes, when the specific action was not even authorized by the Security Council. Some of these instances include the establishment of no-fly zones in Northern and Southern Iraq in 1991 and 1992, the bombing of the Bosnian Serbs by the NATO in 1995, and the NATO's Kosovo campaign against Yugoslavia in 1999. Many instances of intervention, though unauthorized, have been also declared legitimate – like NATO's intervention in Kosovo in 1999, the military intervention in Libya, though frowned upon by several states in the international community, but was authorized by the Security Council in Resolution 1973, in ostensible exercise of its powers under Chapter VII of the UN Charter.

The foremost principle in international law is respect for the territorial integrity of states and prohibiting interference in the internal affairs of other states.¹⁹ The accepted exception to this principle is only the right to self-defense²⁰ and Collective Security measures²¹. Further, because Intervention, Security Council-approved, or in self-defense is widely considered legal under international law and thus unlikely to be considered aggression in the first place but there are other views as well, which suggests intervention as an act of a 'legalized aggression' by the third state, fully empowered by the Security Council.²²

Conclusion

It is conclusive that despite of the fact that, the amendments forwarded in the Kampala Conference is a signpost in the expansion of the aggression related laws, still there lies the need to divulge upon some complex issues concerning its enforcement, influenced dispute settlement mechanism and indistinctness. Therefore, there is a dire need to fill the vacuums in the scope crime of aggression which may undoubtedly lead to entropy. To untangle the knots in Aggression laws, *prima facie*, original and *suo motu* jurisdiction should be conferred upon the Apex Court of both the state parties to the conflict, where preference must be given to the state who has the chief authority to prosecute the accused. For the same, there should be a consensus made among the signatory states to develop their own domestic laws. Since the Crime of aggression totally diminish the humanitarian principles and thereof, to bestow such jurisdiction on the Court of highest enormity of the signatory states to the Rome Statute would render the outflow of justice in an expedient manner, instead of burdening the ICC.

It is reasonable for states to conclude that Nuremberg and its progeny provide a customary international law basis for prosecuting the crime of aggression under universal jurisdiction as the states have right to try the violators of law concerning their citizens or territory. Moreover, cases of universal jurisdiction over the crime of aggression should be brought only by government prosecutors. Such an approach would enable the prosecuting government to ensure "that public interest considerations, including issues of international comity, can be taken into account in decisions to proceed with such prosecutions." In addition, cases of universal jurisdiction over the crime of aggression should never be tried in absentia, though investigations and indictments in absentia may be acceptable.

Moreover, since crime of aggression is a crime against humanity, therefore, it should always be read along with it to make the process for conviction less complicated and would help to avoid the diversified interpretations. Crime of Aggression should be codified under the domestic laws of the signatory states. It may either be included in the existing penal provisions of the signatory states or it may also be legislated in a separate statute. Though after the Kampala Conference a definition has been framed but the definition lacks accuracy and seems to be vague in its terms and also there is no proper execution of it. Therefore there is a need to execute it uniformly along with equal obligations on state parties after removing all its ambiguities.

To finish with, it is concluded that this crime should also be treated as *jus in bello* considering it as the inherent basic element of all the war crimes.

Therefore, it is the need of an hour to condense the dominance of the developed states which would definitely lead the human kind to a nonpartisan global village.

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QSAR analysis of 6-arylaminobenzoxazinones Derivatives

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Abstract

Quantitative structure activity relationship (QSAR) approach employed to understand the affinity and selectivity of a novel series of 6-arylaminobenzoxazinones derivatives towards progesterone receptor. The generated correlations were found to be statistically significant and exhibited good predictive power. The results obtained from the QSAR study reveal and substituents indicates the importance of aromatic ring, hydrogen bond donor, molecular hydrophobicity and steric influence for receptor binding. The QSAR models suggest that hydrophobic character is crucial for the Progesterone receptor inhibitory activity exhibited by these compounds and inclusion of hydrophobic substituents will enhance the inhibitory activity. The findings of the QSAR study provide a set of guidelines for designing compounds with better PR inhibitory potency.

Keywords: 6-arylaminobenzoxazinones, PR receptor, QSAR

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Introduction

Estrogen and progesterone are two prime female reproductive hormones, have effects on multiple organs beyond reproductive system and their actions are mediated through receptor-based gene stimulation [1]. The progesterone receptor (PR) is a member of the intracellular receptor (IR) superfamily that includes the androgen (AR), estrogen (ER), glucocorticoid (GR) and mineralocorticoid (MR) receptors. Two different isoforms, A and B of PR are present in various target organs of progesterone. It is observed that PR-B acts mainly as progesterone-responsive gene activator, whereas PR-A functions as modulator of PR-B activity and repressor for other IRs, suggesting PR-A to be an important modulator for steroid hormone receptor actions. Primary uses of PR agonist and antagonist combined with estrogen are for the purpose of birth control, hormone replacement therapy, endometriosis, dysfunctional uterine bleeding, dysmenorrhoea, endometrial cancer, uterine leiomyomas, breast cancer, meningiomas and others¹.

Focus on development of more selective and efficacious PR antagonists, have increased to a great extent considering the unwanted effects due to cross-reactivities with other IRs (AR, GR, ER, MR) and GABA (γ -amino butyric acid) receptor.

Experimental Methods

The computing tools used for the present study were the Chemdraw Ultra (Version 8.0) software & energy minimized via MOPAC with energy tolerance value of root mean square gradient 0.001 kcal/mol & maximum number of iteration set to 1000. Conformational search of each energy-minimized structure was performed using the stochastic

approach which is similar to the RIPS Method and validation program VALSTAT (VALSTAT, 2004). The progesterone receptor inhibitor activity data of 6-arylaminobenzoxazinones derivatives were taken from the reported work of Jeffery C et al. The molecular structures of all 25 compounds were sketched using the Chemdraw Ultra (Version 8.0) software & energy minimized via MOPAC with energy tolerance value of root mean square gradient 0.001 kcal/mol & maximum number of iteration set to 1000^{2,3}.

The series was divided in to a training set of 21 compounds & a test set of 4 compounds carried out automatically by the (VALSTAT software, 2004). The sequential multiple linear regression analysis method was employed. The best model was selected from the various statistically significant equations on the basis of the observed squared correlation coefficient (r^2), standard deviation (std.) the sequential Fischer test (F), the Bootstrapping r^2 , chance, Q^2 value, S_{press} value, standard deviation of error prediction (SDEP) & the predictive squared correlation coefficient of the test set (r^2 pred.).

Results and Discussion:

The computing tools used for the present study were the Chemdraw Ultra (Version 8.0) software & energy minimized via MOPAC with energy tolerance value of root mean square gradient 0.001 kcal/mol & maximum number of iteration set to 1000. Conformational search of each energy-minimized structure was performed using the stochastic approach which is similar to the RIPS Method and validation program VALSTAT (VALSTAT, 2004).

The progesterone receptor inhibitor activity data of 6-arylaminobenzoxazinones derivatives were taken from the reported work of Kern JC et al. The molecular structures of all 25 compounds were sketched using the Chemdraw Ultra (Version 8.0) software & energy minimized via MOPAC with energy tolerance value of root mean square gradient 0.001 kcal/mol & maximum number of iteration set to 1000. All conformers generated for each structure were analyzed in conformational geometrics panels with great care, and the lowest energy conformation of each structure was selected & added to a molecular database to compute various physicochemical properties. The series was divided in to a training set of 21 compounds & a test set of 4 compounds carried out automatically by the (VALSTAT software,2004). The sequential multiple linear regression analysis method was employed. The best model was selected from the various statistically significant equations on the basis of the observed squared correlation coefficient (r^2), standard deviation (std.) the sequential Fischer test (F), the Bootstrapping r^2 , chance, Q^2 value, S_{press} value, standard deviation of error prediction (SDEP) & the predictive squared correlation coefficient of the test set (Table 1).

Table1: Comparison of cross validation parameters for generated QSAR models

Model No. SDEP ^c	q^{2a}	SPRESS ^b
1 0.328047	0.821324	0.238603
2 0.312344	0.783425	0.347219
3 0.270365	0.857453	0.305647

^a = Squared correlation coefficient of prediction. ^b = Standard deviation of prediction. ^c = Standard error of prediction

Conclusion:

The QSAR analysis of 25 6-arylaminobenzoxazinones derivatives using a novel set of QSAR descriptors resulted in quantitative models of good statistical significance. The generated QSAR models also showed good predictive potential as established by their high q^2 (>0.7) and hence can be used in the prediction of biological activity of novel molecules prior to their synthesis.

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