Work Related Musculoskeletal Disorders Assessment inCab drivers

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Abstract

Background: The cab drivers have to be in a particular posture for driving. They have to be in a prolonged sitting position till the time they are driving the car, this affects their back, neck, ankle &foot. it was found in the previous studies that these people develop work related musculoskeletal disorders & pain due to their wrong posture. This study focuses on assessment of musculoskeletal disorder in professional cab drivers.

Methodology: It is a one-time observational study,30 cab drivers were involved in the study of the age group 18-55 years. They were screened for the inclusion & exclusion criteria,then they were asked to fill the questionnaire for assessment, analysis of the result will be done finally.

Result: The result shows that the 70% of cab drivers were suffering from lower back pain

Conclusion: In this study we found that most of the car drivers suffers from back pain. They were advised for the posture correction.

Keywords: *WRMSD, posture, pain, musculoskeletal disorder.*

Introduction

Work-related musculoskeletal disorders (WMSD) are the category of musculoskeletal disorders that will include problem related to tendons, tendon sheaths, and synovial lubrication of tendon sheaths, and related to bones, muscles, and nerves of hands, wrists, elbows, shoulders, neck, and back.[1] Many factors make cab drivers different from other occupations in terms of exposure to the risk of work-related disorders. Previous studies said that cab drivers takes longer time in driving than other professions. The design of the seat can affect the posture of drivers and posture in turn also can effect both the comfort and physical conditions of a driver. Work-related musculoskeletal disorders (WRMD) and other postural harm may result in physiological illness that may grow over a long period due to prolonged mechanical stresses levied on the musculoskeletal system. Musculoskeletal pain includes a major health problem for the general population, distressing their quality of life, demanding increased need of health care and organization. A number of previous studies assessed the occurrence of musculoskeletal disorders amongst Iranian workers [2-4] and many other country. It has been suggested that people have changing perceptions about their musculoskeletal problem and insights about illness may influence health outcomes such as pain and disability directly or indirectly by their resultof coping. If a person reflects that musculoskeletal problem is a serious disease that medical care or health services can do little about, this belief may have an effect on the level

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of interference in daily life from that disease that the person reports and on their decision to consult or seek treatment for it. This discloses that perceptions may be an vitalissue to address as part of dropping the impact of disease and reassuring appropriate management.

After headaches and tiredness, back pain is the third most common health problem described by individuals. The exact cause of the augmented occurrence of low back pain (LBP) in populations of professional cab drivers is often uncertain. The most often reported risk factor for LBP is heavy physical workload such as lifting, awkward posture, and whole-body vibration. The prevalence and risk factors of WRMSDs among drivers would vary between countries due to differences in racial background, geographical location, ethnicity, and socio-demographics.. An earlier report found a 70.5% prevalence rate of WRMSDs among taxi drivers.

Bureau of Labour Statistics 2006 data on injury and illness show that the drivers of heavy trucks and tractor-trailers in the US are associated with the second-highest number of occupational illnesses and injuries for the past three years. It has been estimated that the indirect costs of one workday lost due to sickness absence amount to over than five hundred dollars [5]

A study in Japan inspected the risk factors of back pain reports that the prevalence of back pain among 285 taxi drivers was 45.8% which is consistent with other studies [6]. Some investigation showed risks of WMSDs in drivers are very high in Iran [7]. The evidence illustrated that people are driving at least half of working hours each day to endure three times more than other workers [8]. High prevalence of spinal disorders observed among the official worker, truck and bus drivers, particularly back and neck pain, frequently leads to invariable suffering and disease and possibly pre-retirement [9,10]. The aim of this study was to assess the musculoskeletal disorders among cab drivers of Delhi. This study will help us to determine the presence of WRMSD in drivers & to guide them for posture correction to help them in relieving their pain.

Methodology

In the methodology we use Nordic questionnaire. It is used to evaluate musculoskeletal symptoms, and the reliability has been checked out by test re-test system ,tells us that answers ,that are non-distinguishable fluctuate from zero to twenty-three percent, validity test tells us that answers that are non-distinguishable, changed between zero to twenty percent. The validity and reliability of the questionnaire were investigated and approved in different studies and several languages, including the Persian language[11,12] . This study design was one time observational.

Data Collection: The data collection procedures have been done recruiting the cab drivers of the age group 18-55 years & by using a "standardized general Nordic questionnaire". we collect data after taken an informed consent from subject they were explained about the study and they were asked to fill questionnaire. As this questionnaire is used to assess musculoskeletal symptoms& pain specifically back pain we have collected data from cab drivers of Delhi, India about musculoskeletal symptoms. The Inclusion criteria was drivers who drive cab only, drive cab, daily for at least 10 hours&cab drivers who have experience of at least one year of driving a cab&the Exclusion criteria was cab drivers, who were experiencing any kind of systemic or chronic musculoskeletal disease,Drivers who are involved in regular physical activity , Drivers with cardiovascular diseases

Result Analysis: Result was analysed by using SPSS 21 version. Study variables were measured using frequencies and discrete variables were measured by using mean and standard deviation, and as this is descriptive study, we use descriptive index test or frequency test or histogram test or box plot test.

On the analysis of the data we found 70% of cab drivers were suffering from lower back pain. Back pain was found to be most common problem for drivers in their daily activity. Back pain is affecting the daily works of the drivers so they are suggested exercise for their posture correction.

Data:

Age Distribution:

Table 1.1. Showing the Age Distrubution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25 Yr	4	13.3	13.3	13.3
	26-35 Yr	11	36.7	36.7	50.0
	35-45 Yr	11	36.7	36.7	86.7
	45-55 Yr	4	13.3	13.3	100.0
	Total	**30**	**100.0**	**100.0**	

Average Driving Time:

Table 1.2: Showing the Average time of driving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6-10 HR	12	40.0	40.0	40.0
	11-15	18	60.0	60.0	100.0
	Total	**30**	**100.0**	**100.0**	

Drivers Experience:

Table 1.3. Showing the Experience years of driving.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Than 5 Yr	8	26.7	26.7	26.7
	5-10 Yr	17	56.7	56.7	83.3
	11-15 Yr	3	10.0	10.0	93.3
	16-20 Yr	1	3.3	3.3	96.7
	20-25 Yr	1	3.3	3.3	100.0
	Total	**30**	**100.0**	**100.0**	

Table 1.4 Showing the percentage of lower back pain.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	70.0	70.0	70.0
	No	9	30.0	30.0	100.0
	Total	**30**	**100.0**	**100.0**	

Discussion

In the current study found that most of the drivers were suffering from back pain. This affects their activity of daily living and stopping them from doing many works. This is a matter of serious concern because it affects their health & they must be guided for the posture correction & counselling will be done so that they must go for the regular visit to the physician & physiotherapist for the consultation & the treatment of their problem. In ROBB study on professional truck drivers, the most common reported disorders were low back, knee and neck pain.[13] The difference of spine pain between truck drivers and taxi drivers could be connected with the difference of vehicle vibration. Studies show that the vibration dose of taxi is lower than pain is more truck.[1415]

The vibration exposure level for taxi drivers is much lower than that for other professional drivers . Thirdly, direct back injury during motor vehicle accidents (MVAs) is another physical hazard associated with low back disorders of professional drivers.[16] The association between bending/twisting movements while behind the wheel and higher prevalence of LBP is also supported by recent reports from biomechanical experiments .[17,18] The observed association between long duration of car driving and LBP conforms to previous studies on other occupational groups often operating small automobiles.[11] Our cross-sectional analyses of the TDHS baseline data suggested that urban taxi drivers were a high-risk group for work-related LBP. The significantly higher prevalence of LBP (51%) in Taipei taxi drivers than other professional drivers (33%) in Taiwan is consistent with a previous study[18] High prevalence of musculoskeletal disease particular low back pain is possible due to prolong sitting position and absence of enough exercise among truck drivers[19]. Another point is a form of seats. Patterson et al., found that musculoskeletal disorders were the most prevalent health problem in bus drivers[20]. This study showed that low back prevalent in cab drivers.

In a study of Backman, about 70% of the drivers had suffered from musculoskeletal pain during the last month. In all, 40% of the drivers had often had back problem.[21]

Conclusion

The result of the current study showed the significance of frequent musculoskeletal disorders in cab drivers in different body regions, Among these, a lumbar area in drivers is more common .Present study concludes that there is high frequency of musculoskeletal disorders common in cab drivers in Delhi. Most commonly effected regions were upper back and lower back least common was wrist/hands region. This affects their activity of daily living & and stopping them from doing many works of day to day life as well this affects their job also.

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Immediate Effect of Buteyko Breathing and Bhramari Pranayama on Blood Pressure, Heart Rate and Oxygen Saturation in Hypertensive Patients: A Comparative Study

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Abstract

Aim: There are studies showing the use of Buteyko breathing technique & Bhramari Pranayama in reducing cardiorespiratory parameters in normal healthy individuals but to the best of our knowledge there is hardly any study that has reported comparative immediate effect of these two techniques. Thus the aim of our study was to evaluate the immediate effect of these two techniques on Blood pressure, heart rate and SpO2 in Hypertensive patients.

Method: The research design used was Comparative Experimental study design. Total 52 participants were screened and those meeting the inclusion criteria (n=42) were included in the study. The participants were randomly divided into two groups- Buteyko breathing and Bhramari pranayama Group of 21 each. Pre and immediate post intervention scores were measured in terms of systolic BP, Diastolic BP, heart rate and SpO2.

Findings: Inter group comparison (student's unpaired t test) showed that there was no statistically significant difference between the two groups in terms of Systolic and Diastolic BP, Heart rate and SpO2. The comparison of pre and post intervention valuesof the outcome measures in Buteyko group showed a significant difference in Systolic BP, Heart rate and SpO2 values whereas in Bhramari group there was statistically significant difference only the in Systolic BP values.

Conclusion: It can be concluded from the present study that Buteyko breathing and Bhramari pranayama are equally effective in immediately reducing the systolic blood pressure in hypertensive patients.

Keywords: *Buteyko breathing, Bhramari pranayama, Immediate effect, Hypertension.*

Introduction

Hypertension is defined as the persistent high blood pressure.[1] Systemic hypertension is one of the commonest non-communicable diseases in our country and also a prominent hazard to health[2] Around the world, hypertension is the foremost cause of premature mortality, with a rate of one in four men and one in five women.[3] Even though there is remarkable advancement in disease management, 30% of the global mortality are due to CVD.[2] It is considered as a silent invisible killer as the symptoms are usually invisible in early stagesupto occurrence of severe results. The international guidelines (2020) of Hypertension or elevated blood pressure diagnoses a patient with Hypertensionif systolic blood pressure (SBP) in the office or clinic is ≥140 mm Hg and/or diastolic bloodpressure (DBP) is ≥90 mm Hg. Further classification- Grade 1 Hypertension if SBP is

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140–159mmHg and/or DBP is 90–99 mmHg and Grade 2 Hypertension if SBP is≥160 mmHg and/or DBP is ≥100mmHg.[4]

Out of many treatment alternatives, the non-pharmacological interventions comprise a range of measures like reduction of weight, increasing physical activity, diet modification, tobacco and alcohol consumption restriction, yoga & meditationetc[6,7] Main aim of yoga is to makethe individual attain and maintain the "sukhasthanam" that is a dynamic sense of physical, mental and spiritual wellbeing. Pranayama - the science of well-ordered, conscious expansion of Prana (the life force) has many useful effects. A type of Pranayama, Bhramariis originated from the Sanskrit word 'Bhramar' meaning Wasp. The name Bhramari pranayama has come from the humming noise impersonating the flying wasp.[8] There are studies showing the immediate positive effect of Bhramari pranayama on resting cardiorespiratory parameters in normal healthy individuals.[10]

Yet another breathing technique was devised in 1950's by Dr. K P Buteyko.[9] It was basically developed to treat the asthmatics for hyperventilation. It is a unique breathing technique that utilises the breath holding and breath control exercises. Easy to understand and easy to perform are the merits of this technique. There are several studies claiming positive immediate effect of Buteyko breathing technique on cardiorespiratory para metes in healthy adults[12].

Aim: There is hardly any study that has reported comparative immediate effect of these two techniques. Thus the aim of our study was to evaluate the immediate effect of these two techniques on Blood pressure, heart rate and SpO2 in Hypertensive patients.

Materials and Methodology

Our study was a Comparative study. Total 52 Hypertensive (above 40 years of age) subjects residing in Nagpur region and outskirts were considered in the study. Study continued over a period of one month.

Inclusion Criteria:

1. Participants clinically diagnosed with hypertension in the past 20 years[13]
2. Age group -above 40 years
3. Participants with history of Coronary artery bypass grafting or angioplasty in the past 20 years.
4. Participants with addictions like alcohol, tobacco.
5. Participants having history of diabetes and thyroid.
6. Participants engaging in mild physical activity on daily basis.
7. Participants who have taken or are taking medications for hypertension.
8. Participants with a history of respiratory disorders but currently stable.

Exclusion Criteria:

1. Participants with active respiratory infection or kidney problems[21]
2. Cognitively unstable hypertensive patients.
3. Participants unwilling to cooperate in the study.
4. Participants with a history of organ transplant.
5. Participants undergoing any cardiac or respiratory rehabilitation program.

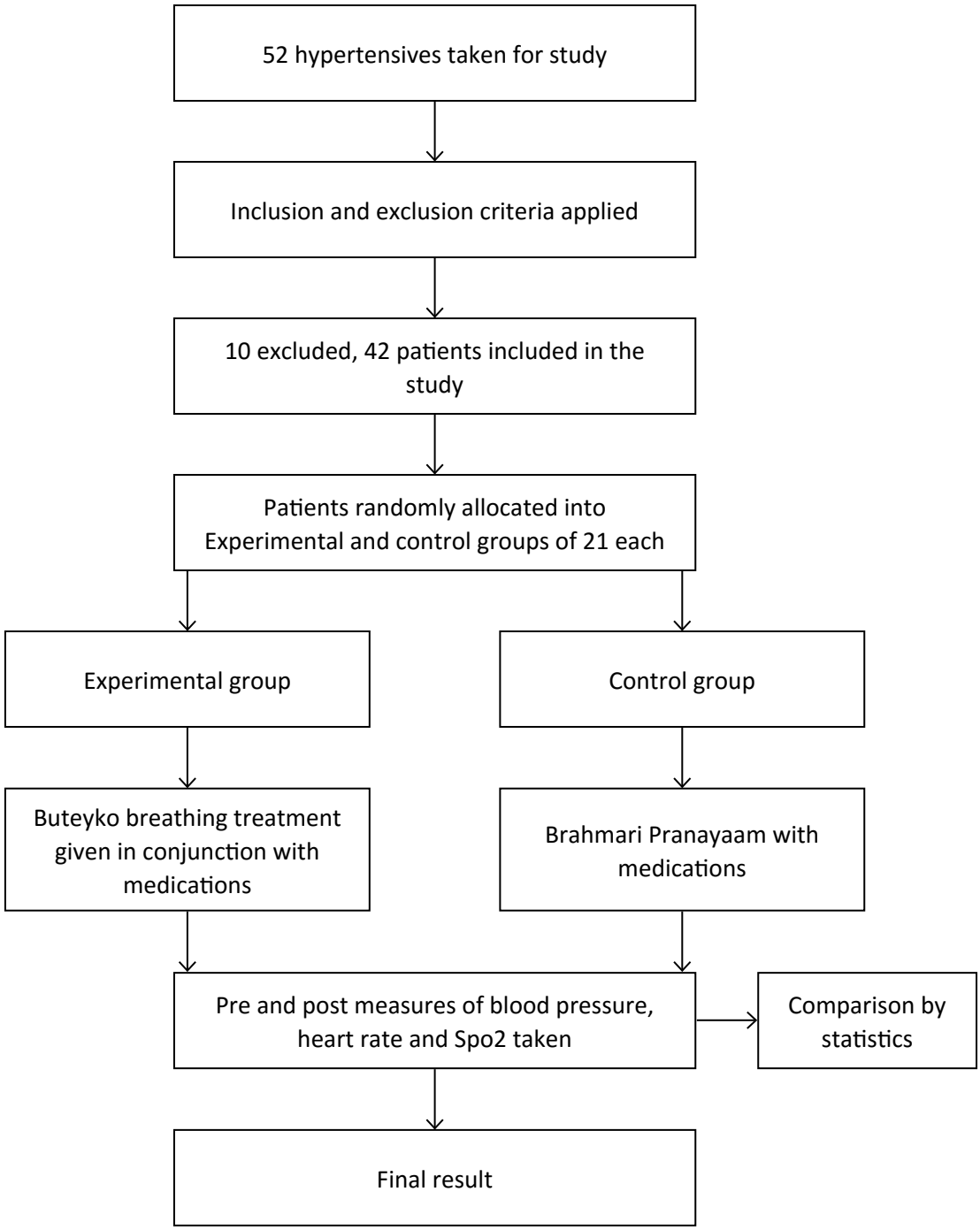
Materials: Digital B.P. apparatus, Pulse oximeter

Outcome Measures: Blood pressure, Pulse rate, Oxygen saturation

Methodology: 52 patients with hypertension were screened for the study. Ethical approval was obtained from Institutional Ethical Committee & an informed consent was obtained from the participants.Inclusion and exclusion criteria was applied and 10 patients were excluded from the study.

The study was conducted on 42 hypertensives fulfilling the inclusion criteria. The participants were randomly divided into two groups Buteyko and Bhramariof 21 each. One group performed the Buteyko breathing exercises and the other performed Bhramari pranayama.

The blood pressure, heart rate and Spo2 of the patients were taken pre Buteyko and Bhramari technique. The techniques were explained through video and audio to the patients and the patients were made to perform it. Immediately after the technique, the post readings of the blood pressure, heart rate and Spo2 were measured.



Buteyko technique:

Step 1: Control pause phase:

The patient was asked to sit in an upright chair, close the mouth and breath in normally through the nose for 30 seconds.

The patients were further instructed to:

- Breathe in a small breath and breathe out
- Then close both the nostrils with empty lungs, taking care lungs are not too void of air
- Keep a count for how much time one is comfortable before feeling urgency to breathe in again and hold on until then
- Breathe in byreleasing the nostrils
- Patients were asked to keep a watch on first breath after CP, to avoid taking a breath deeper than the one taken before CP. Patients were instructed to not

hold the breath for a longer duration as this may lead to deep breathing after measuring the CP.

Step 2: Shallow breathing

The patient was asked to:

- Sit up straight.
- Monitor the amount of air flowing through nostrils by placing the finger under the nose in a horizontal position.
- The patients' finger should lie close enough to nostrils so that the airflow can be felt, but not so close that the airflow is blocked[16]

Patients were asked to repeat Step 1 and 2 for 5 mins (or approximately 6 cycles)

Bhramari pranayama: In an ambient atmosphere patients were made to perform the Bhramari pranayama. The breathing technique was explained and demonstrated in the following manner

To start with, one has to be atease in a relaxed position (Sukhasana) with eyes closed, and maintainan erect and steady posture.

Placing the thumbs on the external auditory meatus, index and ring finger on the closed eyes and ring finger near the nostrils one should breath in slowly through both the nostrils for maximum of 5sec and exhale out completely again through both the nostrils for about 15sec. While exhaling one has to chant the word "AUMmmmmm" with a simultaneous nasal humming sound impersonating the sound of humming wasp. This leads to vibration of the inner nostril and laryngeal walls. With the completion of these steps one completes a cylcle of Bhramari pranayama. (RR 3/min).After 5 minutes of practicing Bhramari pranayama, the outcome measures were reassessed.

Once the pre and post measures of Blood pressure, heart rate and Spo2 were obtained, the statistics of the respective outcome parameters were calculated on the basis of MYSTAT 12 software.

Results

MYSTAT 12 software was used to calculate the results in this study. The outcome measures used were Systolic and diastolic blood pressure, heart rate and oxygen saturation.Mean and standard deviations were calculated to describe all the variables. The paired t-test and the unpaired t-test were used to verify differences between pre- and post-intervention

The gender ratio was 10:11 (10 females and 11 males) in Buteykogroup and 11:10 (11 females and 10 males) in Bhramari group. The difference in the mean age of both the groups was statistically not significant (Table 1).

Table 1. Baseline demographic data of both the groups

Group	Buteyko group	Bhramari group	t value	p value	Inference
Age (years)	60.57 ± 8.96	59.71 ± 8.95	2.17	0.86	Not significant
Gender ratio(M:F)	10:11	11:10			

Table 2: Mean and SD scores of Buteyko group and Bhramari groups, Pre intervention and Post intervention

	Buteyko Group				Bhramari Group				Between groups	
			Paired t test				Paired t test		Unpaired t test	
	Pre intervention Mean ± SD	Post intervention Mean ± SD	Mean Difference	p value	Pre intervention Mean ± SD	Post intervention Mean ± SD	Mean Difference	p value	p value	Inference
Systolic BP	140.75±21.27	125.55±26.42	15.2	0.003	139.61±6.04	129.95±8.25	9.66	0.004	0.56	Not Significant
Diastolic BP	83.15±10.75	84.56±6.56	1.41	0.56	81.28±5.22	82.77±4.98	1.49	0.31	0.31	Not Significant
Heart rate	78.31±12.55	75±8.21	3.31	0.001	75.06±9.07	74±9.65	1.06	0.86	0.62	Not Significant
SpO2	95.91 ± 2.23	97.89 ± 1.36	1.98	0.002	96.35 ± 2.65	97± 1.44	0.65	0.49	0.42	Not Significant

Inter group comparison (student's unpaired t test) showed that there was no statistically significant difference between the two groups in terms of Systolic and Diastolic BP, Heart rate and SpO2 (Table 2). The comparison of pre and post intervention values of the outcome measures in Buteyko group showed a significant difference in Systolic BP, Heart rate and SpO2 values whereas in Bhramari group there was statistically significant difference only the in Systolic BP values.

Discussion

The readings for pre and post values of Heart rate,SpO2 and blood pressure were taken for both Buteyko patients and Bhramari patients. Both the groups were compared for the effects using an unpaired t test. The results showed that there was no significant difference in systolic blood pressure, diastolic blood pressure, heart rate and SpO2 when the two groups were compared (p value - systolic B.P - 0.56,diastolic B.P - 0.31,heart rate - 0.62,SPO2 - 0.42)

However,individually Buteyko technique was helpful in improving systolic blood pressure (p value 0.003) and SpO_2 (p value 0.002), heart rate (p value -0.001)and bhramari was effective in improving systolic blood pressure. (p value 0.004)

The following could be the mechanism of action for Bhramari Pranayaam. Bhramari pranayama being a type of slow speed breathing exercise, it stimulates the parasympathetic nervous system. More they described that while exhaling, vibration effect on the nasal/ laryngeal mucous membrane together with the humming of "AUMmmm" lead to reflex apnoea by turning off inspiratory centre. It causes bradycardia through chemoreceptor sinu-aortic mechanism[14]

Further the neural respiratory elements may be responsible for a mechanism that clarifies how slow deep breathing affects the autonomic nervous system. During extended voluntary expiration, there is an increase in intrathoracic pressure causing more blood flow to the heart from lung and thus increasing the stroke volume. This leads to increased blood pressure causing stimulation of the carotid sinus baroreceptors. The increase in baroreceptor discharge leads to inhibitory action on the vasoconstrictor nerves and excites the vagus innervations of the heart. These may be the possible reasons for reduction in blood pressure in the present study. Another study by Jerath et al. explained that there is decreased oxygen consumption, heart rate and blood pressure resulting from slow deep breathing in pranayama, thus adding more strength to our study[15]

The Buteyko method is based on the concept that hyperventilation is the underlying cause of numerous medical conditions (Rosalba Courtney,2008)[16,17] One possible biochemical mechanism of Buteyko may be through its influence on nitric oxide (NO). NO is involved in a large number of physiological responses including bronchodilation and vasodilatation.[18] Ritu et al (2013) state that Buteyko breathing exercise is useful in management of respiratory rate and heart rate in chronic obstructive pulmonary disease patients.[19]Apart from this, it is also mentioned in studies that holding the breath can cause accumulation of carbon dioxide, that will lower blood pressure, as also breath holding will also improve the collateral ventilation which can be effective reasons for reduction of blood pressure, heart rate and improvement in SPO_2 in some patients. These can be the reasons that individually Buteyko and Bhramari have a significant effect on vital parameters.

The reason for no significant difference in both these two techniques can be that it was an immediate effect study. If the study was for a longer time, then maybe there would have been a significant difference noticed. There are several studies showing the effectiveness of Buteyko in cardiac and respiratory disorders over a long term.[9,10] There are also studies which show the effectiveness of Bhramari in long term on cardiac and respiratory disorders.[8] There are also studies that have shown that there is immediate effect on cardiorespiratory parameters by Buteyko technique.[12] So the study here proves thatButeyko and Bhramari techniques are both effective in hypertensive patients individually, but have no significant difference when compared for immediate effect.

Conclusion

It can be concluded from the present study that Buteyko breathing and Bhramari pranayama are equally effective in immediately reducing the systolic blood pressure in hypertensive patients.

Limitation: The present research was to study the immediate effect, thus the effect of long term treatment was not studied. Also the sample size was less.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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The Normal Response to Slump and Straight Leg Raising Test (SLR) in an Asymptomatic Subjects

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Abstract

Background: Neurodynamics is a test which check the mechanical movement of neurological tissue. It is used in an assessment to gain an impression of neural tissue mobility & sensitivity to mechanical stress. Slump and straight leg raising test are said to be the standard neurodynamics test for the lower limb.

Objectives: The aim of the study is to investigate the effect of neck and ankle position on knee and hip flexion movement during slump and straight leg raising (SLR) test and to know the neural tissue response to the neurodynamic test by addition of sensitizing manoeuver

Material and Method: It is an cross sectional study where 30 male & 30 female asymptomatic subjects in the age group of 18-39 years were taken

Results: It is concluded that there is a change in the range of movement in a normal asymptomatic subjection during Slump and SLR test. Therefore structural differentiating manouver has a significant effect on the body movement

Keywords: *Normal asymptomatic subjects, Neurodynamic test (slump & SLR test), Goniometer*

Introduction

Neurodynamic tests such as the straight leg raising (SLR) and slump test are frequently used for assessment of mechanosensitivity of neural tissue Sensitizing manoeuvres are limb or spinal movements added to neurodynamic tests, which aim to identify the origin of the symptoms by preferentially loading or unloading neural structures. A prerequisite for the use of sensitizing manoeuvres to identify neural involvement is that the addition of sensitizing manoeuvres has no impact on pain perception when the origin of the pain is non-neural.[1]

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Comprehensive evaluation of patients with low back pain must include a method of testing the integrity of related neural tissues. The straight leg raise test is recognized as the first neural tissue tension test to appear. During straight leg raise testing, the leg is elevated with the knee extended and the patient in a supine position. This places a tensile stress on the sciatic nerve and exerts a caudal traction on the lumbosacral nerve roots from L, to S,the straight leg raise test, nonneural structures, such as lumbar zygapophyseal joints, muscles, and connective tissue, can limit leg elevation and provoke patient discomfort during testing Flexing the cervical spine, dorsiflexing the ankle, and medially rotating the hip during the straight leg raise test increases tension exerted on the spinal cord, spinal dura, and lumbosacral nerve roots. In Maitland's slumptest, the patient is seated in full flexion of the thoracic and lumbar regions of the spine. Sensitizing manoeuvres are then systematically applied and released to the cervical

spine and lower extremities, while the tester maintains the patient's trunk position. The slump test evaluates the excursion of neural tissues within the vertebral canal and intervertebral foramen, detecting impairments to neural tissue mobility .They found that full spinal flexion, or flexion of the cervical, thoracic, and lumbar regions of the spine, produces lengthening of the vertebral canal. When the vertebral canal is elongated, the spinal dura is stretched, transmitting tension to the spinal cord, lumbosacral nerve root sleeves, and nerve roots. During full spinal flexion, the cauda equina becomes taut and the lumbosacral nerve roots and root sleeves are pulled into contact with the pedicle of the superior vertebra. When extension of the cervical spine is introduced, the dura and the nerve roots slacken as the vertebral canal begins to shorten. Extending the thoracic and lumbar spine increases the slack in the neural tissues as the vertebral canal continues to shorten.[2]

The straight leg raise (SLR) is a common neurodynamic test used to examine the mechanosensitivity of the lower extremity nervous system in individuals with low back or lower extremity pain. The SLR consisted of placing the knee in end range extension, determined by the examiner as end range resistance, followed by bringing the limb into hip flexion Pre-positioning in ankle dorsiflexion compared to plantar flexion is commonly utilized for purposes of structural differentiation during SLR testing. The movement was stopped at the first moment any sensory response was indicated, including but not limited to the sensation of stretch, pulling, tension, pain, numbness, or tingling.[3]

Methodology

1. **Study design:** Cross sectional study
2. **Study set up:** Physiotherapy department
3. **Selection criteria:**

Inclusion Criteria:

- Asymptomatic subjects were taken
- Age group 18-39 yrs

Exclusion Criteria:

- H/O of low back pain
- Joint injury
- Neurological or vascular impairment

Materials Used: Goniometer

Procedure: Permission to carry out the research were taken from the ethical committee of the Datta Meghe college of Physiotherapy, Nagpur. Subjects who were volunteered to participate in the study were selected keeping in view of inclusion and exclusion criteria. Structural differentiation or sensitizing manoeuvre have a significant effect on test response in terms of range of movement during neurodynamic tests.

The Slump & SLR tests are standard neurodynamics tests for the lower limb, it is demonstrated as follows:

Slump Test Procedure: The subject should be sat on table with the pelvis fixed and thigh fully supported with knees together. The patient is asked to slump the back into thoracic and lumbar flexion. A strap is positioned across the shoulder to maintain thoracic and lumbar flexion so that patient maintain the chin in neutral position. A universal goniometer was placed i.e stationary arm between lateral condyle of knee and greater trochanter and moving arm of goniometer should be placed between lateral condyle of knee and lateral malleolus of ankle. The zero was taken as the point of full extension.

For cervical flexion, the subject was asked to put their chin to chest & the examiner applied ankle dorsiflexion and passively extend the knee until the onset of resistance, then the range of knee flexion should be measured relative to zero. All time, the subject was monitored for the presence of adverse symptoms during testing.

Straight Leg Raising Test Procedure: The subject should be in a supine lying position with the trunk,shoulder and hip in a neutral position. A goniometer was positioned with the stationary arm aligned between the greater trochanter and midline of trunk and moving arm aligned between greater trochanter and lateral condyle of femur. The examined leg should be kept in full extension by placing the examined hand on thigh proximal to knee and other hand under the heel. Subjects were asked to dorsiflex the foot and elevates the leg in a sagittal plane about the hip joint until the onset of resistance. Then the range of hip flexion should be measured relative to zero.

All time, the subject was monitored for the adverse symptoms during testing.

Outcome Measures:

Knee flexion ROM during Slump test

Hip flexion ROM during straight leg raising test

Results

Table No. 1: Distribution of subjects according to age

Age Group	No of Subject	%
19-28	48	80
29-38	12	20
Total	**60**	**100**

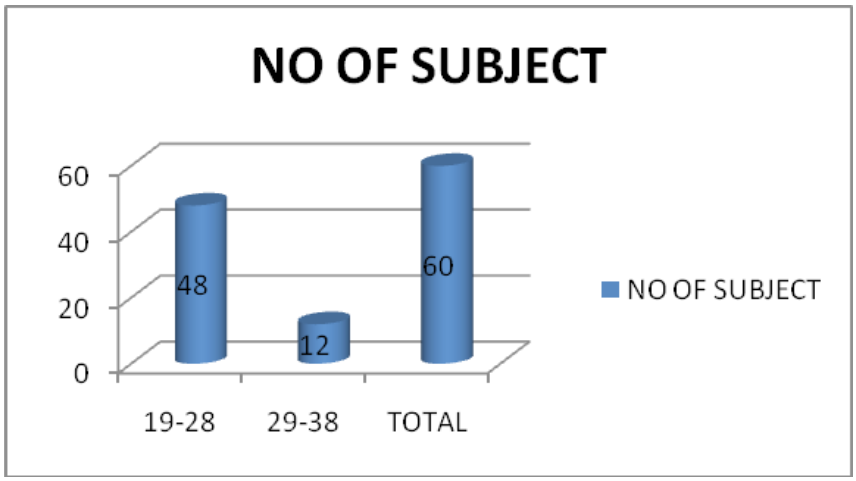

Figure 1

Table no 1 shows that, total 60 subjects were taken out of which 48 were participated in the age group of 19-28 years whereas 12 subjects in the age group of 29-38 years

Table No 2: Distribution of subjects according to Gender

Gender	No of Subject	%
Male	30	50
Female	30	50
Total	**60**	**100**

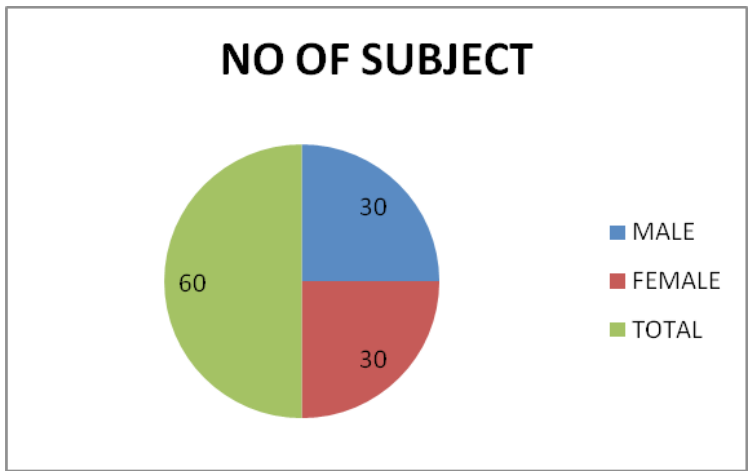

Figure 2

Table no 2 shows that total 60 subjects were taken out of which 30 male & 30 female who were volunteered to participate in the study in the age group of 19-38 years.

Table No 3: Mean and S.D of Flexion

	Male	Female
Knee flexion at slump neck flexed	42.7	37.77
Knee flexion at slump neck extended	48.6	47.6
SLR hip flexion at ankle dorsiflexion	73.9	73.3
SLR hip flexion at ankle neutral	82.23	81.23

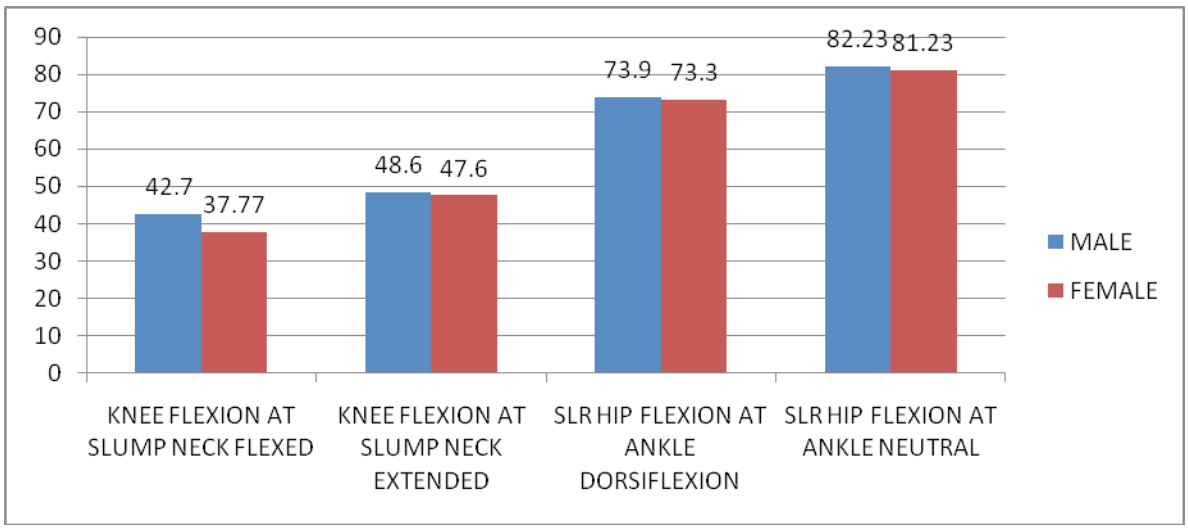

Figure 3

Table no 3 shows that range of knee and hip flexion angle during slump test and straight leg raising (SLR) test .It is found that there is an significant difference in knee & hip flexion angle in both male and female subjects.

Discussion

All data were analysed using statistical package, 60 subjects were taken (30 male and 30 female) who were volunteered to participate in the study between the age groups of 19-38 years. Structural differentiation or sensitizing manoeuvre have a significant effect on test response in terms of range of movement during neurodynamic tests. Cervical flexion & cervical extension during slump test whereas ankle dorsiflexion & ankle neutral during straight leg raising test act as a sensitizing manoeuvre. During slump test it is observed that knee flexion angle decreases when cervical flexion component wasadded, on the other hand knee flexion angle increases when cervical extension component was added both in male and female subjects.

This is supported by the study of P.C Lew, CA. briggs et al who conducted a study on asymptomatic patients between the age groups of 18-30 years he found that whether changing the cervical position during slump test altered posterior thigh pain/or tension in hamstring muscles,and there is an averaged over the group there was a 40% decrease in posterior thigh pain with cervical extension,it indicates that cervical movement did not change hamstring muscle tension the change in experimentally induced pain during cervical flexion was not due to change in hamstring muscle,it is concluded that posterior thigh pain caused by slump test and relieved by cervical extension arises from neural structures rather than hamstring muscle.[4]

This is also supported by Ketakijoshi, charu. Eapen et al who determine normal sensory and ROM responses during the movement components of thoracic slump test in an asymptomatic subjects,he conducted slump test in two sequences,proximal initiation which was proximal to distal and distal initiation which was distal to proximal its results shows the prevalence of sensory responses, its nature area and intensity,it concluded that the intensity of symptoms of proximal initiation

sequences was significant (p>0.05) when compared to distal initiation sequences and there is a change in ROM was significant for distal initiation when compared to proximal initiation,these normal responses is used as a reference when using thoracic slump test.[5]

During straight leg raising test it was found that there was a diminished range of hip flexion due to addition of ankle dorsiflexion, and increase in hip flexion due to addition of ankle in neutral position .Ankle dorsiflexion and neutral act as a sensitizing manoeuvre. The study was based on a sample of asymptomatic subjects in response to standard Neurodynamic test during slump and SLR test following the addition of structural differentiating manoeuvre.This study is supported by Benjamin s Boyd et al who conducted a cross sectional observational study on 20healthy subjects without low back pain,he measured hip flexion angle and surface electromyographic measures were taken and compared at the onset od symptoms P1 and at the point of maximally tolerated symptoms during SLR with ankle dorsiflexion and ankleplanter flexion, he concluded that addition of ankle dorsiflexion during SLR testing induces earlier distal muscle activation and reduces hip flexion motion.[6-8]

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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Forensic Age Estimation from Proximal End of Femur: A Radiological Study in Living Individuals

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Abstract

Age determination is a very essential work in the field of forensic anthropology, which is a scientific study of human skeleton to determine age, sex and time of death to identify an individual. The identification is nothing but the recognition of an individual through various physical features or biological parameters. This study aims to examine the relationship between the stage of epiphyseal union of ossification centres at proximal end of femur & biological age in Chhattisgarh population. The study was carried out in 140 healthy subjects (70 girls and 70 boys) aging from 13 to 20 years. The obtained results revealed that the complete fusion of epiphysis of proximal end of femur is seen at 17-19 years. Females were consistently developing epiphysealunion at a younger age than their male counterparts with one year of difference. Results also suggest that the age of epiphyseal fusion at proximal end of femur is found to vary greatly all over the India, indicating the need for separate standards for separate regions.

Keywords: *Epiphyseal Union, Head of femur, Greater trochanter, Lesser trochanter.*

Introduction

Age determination by the epiphyseal fusion of bones is an intrinsic part of the biological characteristics by a forensic anthropologist to assist in achieving the identification of an individual. There are many well-known variables for identification of an individual like birthmarks, mal-formations, tattoo marks, scar marks etc. These types of identification are done by the forensic anthropologist. Several decomposed, burned, mutilated bodies are difficult to recognise & hence the identification of an individual becomes difficult[1,2]. Forensic anthropologist plays a crucial role in age determination & is one of the stringent problems in the medical justice system in both civil & criminal matters. As age advances, it becomes a wide problem in view of factors like nutrition, heredity, race, endocrinal etc. By taking into account the radiological analysis, this study will be of great help in further understanding the details of accurate assessment of age in Central Indian population[3,4,5].

Aims and Objectives:

1. To evaluate age specific difference in epiphyseal union at proximal end of femur.
2. To estimate age from epiphyseal union at proximal end of femur.
3. To compare bisexual difference in epiphyseal union at proximal end of femur.
4. To compare the findings of epiphyseal union at proximal end of femur in Central Indian population with other parts of India on the basis of previous studies.

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Material and Method

The present study was carried out in the Department of Forensic Medicine & Department of Radiology, SSIMS, Bhilai, Chhattisgarh. A total of 150 individuals participated in this study. The subjects included were students of 13-20 years of age from schools & colleges from Bhilai & Durg city. They are born to parents domicile from Central India & have lived here since birth. The subjects do not have any disease/deformity related to bones or chronic disease affecting the general health. An informed consent was taken from all subjects prior to each procedure. Skeletal maturity was evaluated according to the Jit & Kulkarni's classification[1] of four stages: Appearance, Non fusion, Partial fusion & Complete fusion. X-Rays showing clear gap between the epiphyseal and diaphysial ends & showing saw tooth like appearance end were designated as "Non-fusion" (NF) X-rays. X-Rays showing a line replacing the hiatus between the epiphyseal & diaphysial ends & not showing saw tooth like appearance were designated as "Partial Fusion" (PF) X-rays. X-Rays showing the same bony architecture in the diaphysis and epiphysis & showing scar of the previous stage were designated as "Complete Fusion" (CF). It was classified, analysed and compared with known standards. At the end conclusions were drawn, which were compared with available results of various previous studies.

Results

Table 1: Epiphyseal fusion in males:

Age (years)	Head of femur			Greater trochanter			Lesser trochanter		
	NF	PF	CF	NF	PF	CF	NF	PF	CF
13-14	3	7	0	4	6	0	3	7	0
14-15	1	9	0	2	8	0	1	9	0
15-16	0	10	0	1	9	0	1	9	0
16-17	0	8	2	0	8	2	0	8	2
17-18	0	4	6	0	3	7	0	4	6
18-19	0	0	10	0	0	10	0	0	10
19-20	0	0	10	0	0	10	0	0	10
Total	**70 (100%)**			**70 (100%)**			**70 (100%)**		

Table 2: Epiphyseal fusion in females

Age (years)	Head of femur			Greater trochanter			Lesser trochanter		
	NF	PF	CF	NF	PF	CF	NF	PF	CF
13-14	0	10	0	0	10	0	0	10	0
14-15	0	9	1	0	8	2	0	9	1
15-16	0	7	3	0	7	3	0	7	3
16-17	0	2	8	0	1	9	0	2	8
17-18	0	0	10	0	0	10	0	0	10
18-19	0	0	10	0	0	10	0	0	10
19-20	0	0	10	0	0	10	0	0	10
Total	**70 (100%)**			**70 (100%)**			**70 (100%)**		

In males, Head of femur shows: non fusion in 4 (5.71%) cases in age group of 13-15 years, partial fusion in 38(54.28%) cases in age group of 13-18 years & complete fusion in 28 (40%) cases in age group of 16-20 years. Complete fusion is seen in all the subjects in age group of 18-20 years. In females, Head of femur

shows: partial fusion in 28 (40%) cases in age group of 13-17 years & complete fusion in 42 (60%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 17-20 years.

In males, Greater trochanter shows: non fusion in 7 (10%) cases in age group of 13-16 years, partial fusion in 34 (48.57%) cases in age group of 13-18 years & complete fusion in 29 (41.43%) cases in age group of 16-20 years. Complete fusion is seen in all the subjects in age group of 18-20 years. In females,Greater trochanter shows: partial fusion in 26 (37.14%) cases in age group of 13-17 years & complete fusion in 44(62.85%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 17-20 years.

In males, Lesser trochanter shows: non fusion in 5 (7.14%) cases in age group of 13-16 years, partial fusion in 37 (52.86%) cases in age group of 13-18 years & complete fusion in 28 (40%) cases in age group of 16-20 years. Complete fusion is seen in all the subjects in age group of 18-20 years. In females, Lesser trochanter shows: partial fusion in 28 (40%) cases in age group of 13-17 years & complete fusion in 42 (60%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 17-20 years.

Discussion

Table 3: Comparison of Age of union (years)

Sr. No	Researcher	Region/population	Union of head, greater trochanter & lesser trochanter with shaft of femur (years)	
			Male	Female
1	Davies & Parson[2]	England	19-20	19-20
2	Hepworth[3]	Punjabi	15.5 - 17	15.5 - 17
3	Flecker[4]	Australians	17	14
4	Galstaun[5]	Bengalis	16-19	14-15
5	Chaurasia[6]	Indian	17-18	17-18
6	Parikh[7]	Indian	16 - 18	16 - 18
7	Nandy[8]	Indian	16 - 17	14 - 15
8	Vij[9]	Indian	17 - 18	17 - 18
9	Bhise S et al[10]	Mumbai	16 - 18	14 - 16
10	Sharma Y et al[11]	Udaipur	18-19	18-19
11	Devraj N et al[12]	Dhule	-	17-18
12	Present Study	Central India	18-19	17-18

When we compare our study with the previous studies for female population we found that our study is in agreement with studies conducted by Chaurasia[6], Parikh[7], Vij[9], Sharma Y et al[11] & Devraj N et al[12]. Whereas for male population we found that our study is in agreement with studies conducted by Galstaun[5], Chaurasia[6], Parikh[7], Vij[9], Bhise S et al[10] & Sharma Y et al[11]. If we carefully go through the above chart and analyse the overall age range for the Union of head, greater trochanter & lesser trochanter with shaft of femur, we found out that there is a lot of regional variation. So address this problem there is immense need of such studies in different regions of our country & these studies must include larger sample size.

Summary and Conclusion

1. This study was conducted exclusively on the young indigenous population of Central India.
2. The epiphyseal union at proximal end of femur in males is completed in all instances (100%)at the age of 18-19 years.
3. The epiphyseal union at proximal end of femur in females is completed in all instances (100%) at the age of 17-18 years.

4. Females were consistently developing epiphysealunion at a younger age than their male counterparts, with one year of difference.
5. Central Indian population is of mixed type comprising of various religions and castes. The opinion about age should always be given in the range.
6. From this study, range of 1-2 years of margin of error can be concluded.
7. For age estimation, relevant joints should be radiologically examined for different centres and opinion should be arrived considering the status of multiple centres.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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A Prospective Observational Case Series of Liver Injury in Paediatric Patients Secondary to Consumption of Ayurvedic Herbomineral Formulations.

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Abstract

Background: Ayurvedic medicines especially herbomineral formulations are combinations of metals and herbs but not in a raw form. There are very good positive things in society about these herbomineral medicines and lots of misconceptions in modern world and modern scientist. They are much confused that how ayurvedic doctors can use metals in medicines; because they feel that metals are toxic to human body, metal can cause hepatotoxicity and nephrotoxicity. This is on scientific level totally confusion and misunderstanding in the mind of allopathy people. Why this confusion arises…? Actually they must little bit understand about ayurvedic science. This science never suggests to use these metals in the raw form. They are converting these metals totally nano particle level so original metal has been lost its molecular structure and it is completely new ayurvedic bhasmas are only oxides of metal. First purify the metal and after purification with lots of complicated biochemical processing, converting them into such molecule that molecule does not have a single raw metal molecule. This must be understood that final product is completely different than raw metal used. If try to study this things then nobody will challenge to ayurvedic science.

Aim: Observe the incidence of hepatic injury in paediatric patients due to herbomineral drug consumption.

Material and Method: In this prospective case series 5 drugs regimen of herbomineral medicine was given to 14 paediatric patients of age group 4 years to 14 years who were diagnosed as reactive and recurrent respiratory disease. The total duration of drug delivery was 90 days. After successful completion of treatment course Liver Function Test (LFT) of each patient was done and conclusion was drawn.

Outcomes: Total 14 patients, biomarkers of Liver Function Test were observed normal and at last follow up every patient was clinically fine.

Conclusion: Use of herbomineral medicines in paediatric patients is safe and it does not cause hepatotoxicity.

Keywords: *Hepatotoxicity, Liver injury, Herbomineral formulation, Paediatric, Drug Induced Liver Injury, Ayurvedic Medicines. Liver Function Test, Nephrotoxicity.*

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Introduction

Ayurveda believes in eradicating the disease right from its root and propound drugs that cause no complications. The metabolism of drugs depends upon the Bhautikagni's (enzymes) in liver and the Dhatvagni's in the cells or tissues.[1,2] In order to produce main desired

effect a drug must be present in appropriate concentration at the site of action. The optimum concentration of the drug depend upon the dose administered and the extent and rate of its digestion, absorption, localisation or bioinformation and excretion.[3] Despite rapid advancing theories in modern pharmacology; much a remains to be said about drug versus disease, pharmacokinetics, biotransformation, selective affinity of drugs to a particular cell or system.[4] Ayurveda believes in treatment without complications and therefore the Ayurvedic drugs as remain administered show s no encouraging pharmacodynamic or chemicotherapetic actions, they show only the pharmacotherapeutic actions well.[5]

The use of herbomineral Ayurvedic formulations is sensible and objectionable topic from the site of western science followers but at the same time the use of these medicines is interesting in Ayurvedic practitioners as they get desired effects among the patients. Various articles regarding the nephrotoxicity and hepatotoxicity secondary to consumption of Ayurvedic herbomineral and metallic medicines are found at internet. To address such issues the study was conducted to make evidence based knowledge and to claim the safe use of herbomineral medicines in paediatric population.

This prospective clinical trial was done with well informed consent in paediatric patients under the age group of 4 to 14 years which were diagnosed as Reactive and recurrent respiratory diseases and herbomineral five drug regimen was given for 3 months. Study was conducted at government Ayurvedic college osmanabad, Maharashtra in 2017-2018. Patients were observed for Hepatic pathological changes by applying biomarkers of Liver Functions.

This study provides evidence to use of Ayurvedic herbomineral medicines in children without causing harm to liver and also build confidence regarding the use of Ayurvedic herbomineral medicines among Ayurvedic practitioners and society also.

Material and Method

Study design

Study type: Observational, Prospective Clinical Trial.

0.- 14 participants of age group 4 years to 14 years.

Study duration: 1 year.

Group and cohorts: Single group/cohort diagnosed reactive and recurrent respiratory disease.

Sampling Method: Non-probability sample.

Study population- Children's in the age group of 4 to 14 years suffering from Reactive and recurrent respiratory diseases was involved in study and given 5 herbomineral drugs regimen for same illness.

Criteria: Inclusion criteria – children in the age group of 4 to 14 years presenting with complaints of recurrent respiratory illness episodes wheeze associated respiratory illness, reactive airway disease. Exclusion criteria - children suffering from tuberculosis, congenital heart disease and malformations, child suffering from any hepatic disease and any life threatening conditions.

Intervention: 5 herbomineral drugs regimen from standard and GMP certified Pharma Company.

1. Swaskaschintamani rasa[6]
2. Swaskuthar rasa[7]
3. Laxmivilas rasa[8]
4. Abraka bhasma (shataputi)[9]
5. Sitopaladi churna.[10]

Dose: Dose was decided as per age according to Sharangadhara samhita[11] and after discussed with higher authority of concerned subjects (Rasashastra department and paediatric department of institute). Above mentioned 5 drug regimens in powder form, 500 mg up to 7 years and 1 gm to above 7 years children BID after meal.

Anupana (vehicle): Honey

Duration of drug delivery: 5 drug combination was given for 3 months at one month interval.

Consent: Child was enrolled in study after taking well informed written consent from parents.

Follow up- total 4 follow ups were conducted at one month interval. At last follow up Liver Function test of each patient was done at authentic pathology laboratory.

Case Series:

Table 1: Case series/case details

Case	Age in years	Sex	Weight in Kg	Present complaints	History	Diagnosis	Treatment	Written Consent
Pt -1	14	M	35.6	Dry cough, cold, chest pain	Specific food and seasonal aggravation, repeated medication and nebulisation.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -2	7	M	16.4	Rhinitis	Repeatedly received medication and nebulisation.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt-3	7	M	13.8	Breathlessness, cough, cold	Asthama in grandparents, repeated medication and nebulisation.	Reactive airway disease	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt-4	5	F	13.1	Cough, cold	Seasonal and specific food aggravation, parental allergy, repeated medication and nebulization	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt-5	7	F	15	Rhinitis	Specific food aggravation, repeated use of nebulisation.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -6	5	F	14.6	Cough and cold	Parental allergy, specific food and .seasonal agrravation	Reactive airway disease	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt-7	13	M	27	Continuous rhinitis	Specific food and seasonal aggravation, repeated medication for same illness.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -8	11	M	33.4	Continuous dry cough	Grand Parental allergy, specific food and seasonal aggravation	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -9	5	F	15.3	Cough with bouts	Seasonal and specific food aggravation, parental allergy, repeated medication and nebulisation	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -10	4	F	12.6	Tonsillitis, fever, cough, cold.	Specific food and seasonal aggravation, repeated medications for same illness.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -11	10	M	21.6	Running nose	Seasonal and specific food aggravation, parental allergy, repeated medication and nebulisation.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -12	14	M	50.2	Cough, cold, fever	Seasonal aggravation, repeated medication, parental allergic rhinitis.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -13	4	M	13.5	Rhinitis	Seasonal and specific food aggravation, parental allerg.	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes
Pt -14	5	M	12.5	Cough, cold	Seasonal and specific food aggravation, parental allergy, repeated medication and nebulisation	Recurrent respiratory disease/illness	Swaskaschintamani rasa, swaskuthar rasa, lsxmivilas rasa, abhraka bhasma, sitopaladi churna.	Yes

Results

The present observational clinical trial was carried out to observe the liver injury after giving Ayurvedic herbomineral medicines to paediatric patients had same diagnosis. After successful completion of 3 months treatment course Liver Function Test was done and following results were obtained.

Table 2: Liver Function Test (LFT) Patient's Value

Sr.No.	Bilirubin Total (mg/dl)	Direct (mg/dl	Indirect (mg/dl	S.G.O.T. (U/L)	S.G.P.T. (U/L)	Total Proteins (g/dl)	Albumin	Globulin	Alkaline Phosphate (U/L)
Patient-1	1.00	0.6	0.4	23	12	6.7	4.4	2.3	214
Patient-2	0.35	o.35	0.00	31	18.3	-	-	-	-
Patient-3	0.86	0.19	0.67	41	25.6	6.7	3.6	3.2	101.3
Patient-4	1.0	0.6	0.4	37	28	6.7	3.6	3.1	-
Patient-5	1.2	0.7	0.5	38	20	5.8	4.2	1.6	-
Patient-6	0.87	0.34	0.53	40.3	39.2	-	-	-	115
Patient-7	0.9	0.3	0.6	28	19	6.4	3.5	2.9	-
Patient-8	1.0	0.4	0.6	41	33	7.0	3.5	3.50	-
Patient-9	1.96	1.37	0.59	31	23.3	-	-	-	-
Patient-10	1.0	0.6	0.4	38.9	22.1	6.7	4.2	2.5	-
Patient-11	0.54	0.24	0.30	39.7	20.6	7.27	4.25	3.02	-
Patient-12	0.48	0.46	0.02	19	11.3	-	-	-	-
Patient-13	0.9	0.5	0.4	30	22	7.9	4.5	3.40	-
Patient-14	0.5	0.2	0.3	35.1	16.5	6.24	3.64	2.6	-

Discussion

Generally speaking, Ayurvedic drugs possess no toxicity nor do they cause any complication and therefore, the Ayurvedic treatment never causes iatrogenic diseases (diseases caused by misguided treatment). But if the disease has not been properly diagnosed and only symptomatic treatment is given the duration of treatment is unnecessarily increased and obviously, this has socio-economic repercussions. Even though drugs have got active principles which with they work, they have some other fractions which counteract their bad effects, if any. Therefore Ayurveda advocates that drug should be used as a whole so that the desired effects may be had without any side effects.[12]

In Ayurvedic medicines the calculated proportion of ingredients in different formulations has a scientific meaning behind it. Disturbance in that proportion causes incompatibility. Once these explanations are accepted, it should be admitted that Ayurveda treats the patient while other systems of medicine treat the disease. To a lay and ignorant man, it is difficult to understand a disease without patient and a patient without disease.

There are some Ayurvedic metallic preparations, but they are fully and perfectly purified before administration. The finished product of Ayurvedic formularies does not cause any toxic or side effects. In some of the formulations antidotes are addedto avoid any possibility of toxic effects. Majority of Ayurvedic drugs show only the pharmacotherapeutic actions and do not cause any complication.[13]

Some articles published in journal regarding hepatic toxicity[14] and nephrotoxicity secondary to consumption of Ayurvedic medicines are observed and to address such articles the study was conducted. Paediatric department of this institute several times used Herbomineral medicines in children and does not noted any adverse effect of such medicines till date. Actual study was conducted over the paediatric patients suffered from recurrent respiratory illness and reactive airway disease[15], and herbomineral medicines (5 drug regimen)for 3 months. Along with this, to observe hepatotoxicity secondary to these combinations Liver Function Test was carried out after successful completion of treatment. And results was found no any pathological changes in the biomarkers

of liver function after given the herbomineral 5 drugs combination for 3 months in appropriate dose.

Conclusions

The present study,In this 14 patients observational clinical trial it was observed that use of Ayurvedic herbomineral medicines is safe and there is no relation to hepatotoxicity secondary to consumption of Ayurvedic herbomineral formulations.

Concluded as:

1. The aim of treatment is to cure the disease and to restore the health. Proper selection of drugs brings desired effects. Keeping all the pharmacological aspects in view, a drug should be chosen and employed to cure a disease.
2. Drug administration should be preceded by perfect diagnosis of disease and followed by expected results only.
3. the social implication of medicine is to see that man remains healthy and happy, and also useful to society. except in case where life itself is in danger, any drug causing iatrogenic disease should be socially and ethically contrabanded.

The Ayurvedic drugs fulfil all above requirements and therefore, satisfy the social obligation of medicine.

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Study of Non-Stress Test as a Screening Tool in Low Risk Pregnancies at Term Gestation

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Abstract

Introduction: Various antepartum surveillance method aim at early detection of fetal distress preventing intrauterine fetal death. Non Stress Test is one such tool used for screening antenatal patients. In this study non stress test is used to screen and monitor fetus of low risk mothers, to detect fetal distress take necessary intervention and correlate fetal outcome with test results.

Materials and Method: This was a prospective longitudinal study conducted in Shalini Tai Meghe hospital and Research Centre, Wanadongiri, Nagpur from august 2019 till August 2020. 180 Antenatal patients with 37 completed weeks in labour and with no high risk factors were included in the study. Non Stress Test was performed on the patients and according to NICE guidelines, the result was interpreted as normal or abnormal.

Results: Out of 180, 130 patients had normal Non-Stress Test and 46 patients had abnormal Non Stress Test. The percentage of normal delivery was 60.4% in normal non stress test group and 23.91% in abnormal non stress test group, where as the percentage of caesarean section was 33.58% in normal non stress test group and 63.04% in abnormal non stress test group. The most common indication for caesarean section in abnormal non stress test group was fetal distress with 68.96%. Meconium stained liquor was present in 73.91% patients with abnormal non stress test, with negative predictive value 72.34%, sensitivity 73.91% and specificity 72.34%. APGAR score < 7 at 5 minutes was present in 34.78% patients with abnormal non stress test group, with negative predictive value 81.36%, sensitivity 34.78% and specificity 97.76%. 18 babies from abnormal non stress test group were admitted in NICU with no perinatal mortality.

Conclusion: Non stress test is a reliable screening tool for detecting high risk fetus in low risk mothers. The probability of adverse outcome like meconium stained liquor, low APGAR score, NISU admission increases with abnormal non stress test.

Keywords: *APGAR score, NISU, stress test, liquor and risk fetus.*

Introduction

Maternal mortality has been drastically reduced in developing countries and now modern obstetricians are more focused on maternal as well as fetal wellbeing. Originally, fetus was still deemed a conception result, but today the fetus is deemed another patient, and it often needs as much supervision as mother's well being. Intra partum monitoring of fetal health is one of the main component of contemporary obstetrics education. Approximately 50 % of fetal mortality happens in low risk mothers without obvious cause.(1)

Prof E. H. Hon and Prof. Caldeyro Barcia invented cardiotocogram (CTG) for fetal monitoring (2). In the

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western countries,continuous fetal monitoring is being used extensively but due to economic constraints, itis not feasible in most of the developing countries like ours for practicing it. Ingemarsson et al.[3] has described analternative, in the form of Admission Test(AT) or Non stress test (NST) which is a short recording of FHR by cardiotocogramanduterine contractions of 15-20 minutes, at the time of admission in labour ward.

Non Stress Test is a non invasive, patient friendly, highly simple to perform and results are easily interpreted. The test detects transient FHR acceleration associated with fetal movements affecting the cerebral cortex and is caused by physiological and pathological effects on the brain of the fetus.

NST could be used as a screening technique to diagnose preexisting fetal hypoxia, and to schedule early intervention to avoid perinatal adverse outcome. The preset research was performed to forecast the perinatal result by conducting NSTas an admission test to minimize fetal morbidity and mortality by early diagnosis and intervention

Nice (2007) Classification of FHR trace feature[4]:

Feature	Baseline	Variability	Deceleration	Acceleration
Reassuring	**110-160**	**_>5**	**None**	**Present**
Non–reassuring	100-109 161-180	<5for 40-90min	Typical variable deceleration with over 50%of contraction, occurring for over 90min Single prolonged deceleration for up to 3min	The absence of acceleration with otherwise normal trace is of uncertain significance
Abnormal	<100 >180	<5 for 90min	Either atypical variable decelerations with over 50% of contractions or late decelerations, both for over 30 minutes Single prolonged deceleration for more than 3 minutes	The absence of acceleration with otherwise normal trace is of uncertain significance

Categorise cardiotocography traces as follows:

- **Normal:** All features are reassuring
- **Suspicious:** 1 non-reassuring feature and 2 reassuring features
- **Pathological/abnormal:** –1 abnormal feature or 2 non-reassuring features(4)

Aim of the Study: To study the role of Non Stress Test as a screening tool in management of low risk pregnancies in labor.

Materials and Method

Antenatal patients with 37 completed weeks in labour and with no high risk factors were included in the study. High risk pregnant patients like pre eclampsia, severe anaemia, heart disease, gestational diabetes mellitus, antepartum eclampsia, twins, previous lscs, intrauterine growth restriction were excluded from the study.

Informed written consent were taken from the patients. Detail history, general examination, systemic examination and obstetric examination was done. Routine blood investigations were done.

Non stress test was performed on the patient with patient in supine position. The Doppler transducer was strapped to the abdomen at the location where fetal heart sound was distinctly heard. The tocodynamometer was strapped at the fundus of the uterus. The fetal movement probe was given to the patient to press at the the time of fetal movement. Record was taken for full 20 minutes. Tracings were categorized according to NICE guidelines(4) as normal, suspicious and abnormal or pathological.

If NST was normal, monitoring was carried out with intermittent auscultation of fetal heart sounds. Repeat NST was done after 3 hours. If NST was suspicious, further extended NST was done for the patient for 40 minutes after following corrective measures like - patient

given left lateral position, oxygen was given, patient was hydrated with I.V fluids. If extended NST was found to be still suspicious continous monitoring with NST carried out till NST turns out to be normal. If NST turns abnormal, artificial rupture of membranes was attempted and decision for termination of pregnancy by LSCS, or instrumental delivery was taken dependingon amount and color of liquor and stage of labour.

Results

Total 180 antenatal patients in first stage of labour were included in the study. Maximum patients were in the age group of 21- 30 years i.e 82.22%. 11.11% patients were more than 35 years of age and 6.66 % patients were 18-20 years of age .51.66 % patients were primigravida and 48.33% were multigravida. Out of 180, 134 (74.4%) patients had normal NST recordings. 46 patients (25.55%) had abnormal NST out of which 26 had suspicious NST and 20 had pathological NST.

Table 1: Correlation of mode of delivery with admission NST

	Normal NST	**Abnormal NST**	
Ftnd	81(60.4%)	11 (23.91%)	92
Instrumental Delivery	8 (5.9%)	6 (13.04%)	14
Lscs	45 (33.58%)	29 (63.04%)	74
Total	134	46	180

As seen in the table, out of 134 patients with normal NST, 81 patients (60.4%) had full term normal delivery, 8 patients (5.9%) had instrumental delivery and 45 patients (33.58%) had caesarean section. Out of 46 patients with abnormal Non Stress Test, 11 patients (23.91%) had full term normal delivery, 6 patients (13.04%) had instrumental delivery and 29 patients (63.04%) had caesarean section.

Table 2: Indication of LSCS in all types of NST

Indication of LSCS	**Normal NST (n=134)**	**Abnormal NST (n=46)**
Fetal Distress	3(6.66%)	20 (68.96%)
Others	42 (93.33%)	9 (31.03%)
Total	**45**	**29**

In normal Non Stress Test Group, out of total 45 caesarean sections, 3 patients (6.66%) had caesrean section due to fetal distress. In patients with abnormal Non Stress Test, out of 29 caesarean sections, 20 patients (68.96%) had caesarean sections for fetal distress.

Table 3: Correlation of NST with Meconium stained liquor

Status of Liquor	**Normal NST (n= 134)**	**Abnormal NST (n=46)**	**Total (n= 180)**
Liquor Clear	121(90.29%)	12 (26.08%)	133(73.88%)
Meconium Stained Liquor	13 (9.70%)	34 (73.91%)	47(26.11%)

As seen from above table, liquor was clear in 121 patient (90.29%) with normal Non Stress Test, where as 13 patients (9.70%) with normal Non Stress Test had meconium stained liquor. Out of 46 patients with abnormal Non Stress Test, clear liquor was present in 13 patients (9.70%) while meconium stained liquor was present in 34 patients (73.91%). Out of total 180 patients 73 .88 % patients had clear liquor while 26.11% patients had meconium stained liquor.

Table 4: Correlation of NST with APGAR Score

APGAR Score	Normal NST	Abnormal NST
APGAR>7 AT 1 MIN	128(95.5%)	21(45.65%)
APGAR<7 AT 1 MIN	6(4.47%)	25(54.34%)
APGAR>7 AT 5 MIN	131(97.76%)	30(65.2%)
APGAR<7 AT 5 MIN	3(2.23%)	16(34.78%)

The table depicts the correlation between NST and APGAR score. At 1 minute, APGAR score was equal to or more than 7 in 128 babies (95.5%) and APGAR was less than 7 in 6 babies (4.47%) among patients with normal Non Stress Test. In babies of patients with abnormal Non Stress Test, 21 babies (45.65%) had APGAR at 1 minute,equal to or more than 7 and 25 babies (54.34%) had 1 minute APGAR less than 7. At 5 minutes, 3 babies showed improved APGAR more than 7, in normal NST group. So finally at end of 5 minutes, only 3 babies with low APGAR less than 7 were admitted in neonatal intensive care unit.

In abnormal Non Stress Group, 25 babies (54.34%) had APGAR score less than 7 at 1 minute. After 5 minutes, 9 babies showed improved APGAR of more than 7 . So at the end of 5 minutes 16 (34.78%) babies had APGAR less than 7 and were admitted to neonatal intensive care unit.

Table 5: Correlation of NST with fetal outcome

	Normal NST	Abnormal NST
Admission in NICU	4(2.98%)	18(39.13%)
Neonatal Death	0	0

4 babies (2.98%) were admiited to neonatal intensive care unit from normal Non Stress Test group, out of which 3 babies had low APGAR and 1 baby had good APGAR more than 7. 18 babies (39.13%) from abnormal Non Stress Test group were admitted to neonatal intensive care unit, out of which 16 babies had low APGAR, 2 babies had good APGAR with congenital anomalies. There was no neonatal death.

Performance Characteristics of Non Stress Test:

	Sensitiivity	Specificity	Positive Predictive Value	Negative Predictive Value
APGAR < 7 AT 1MIN	54.34%	95.52%	80.64%	85.90%
APGAR < 7 AT 5MIN	34.78%	97.76%	84.21%	81.36%
MSL	73.91%	90.29%	72.34%	90.97%
NICU Admission	39.13%	97.01%	81.81%	82.27%

Discussion

In our study,total 180 patients were studied. Out 180, 134 patients (74.44%) had normal Non Stress Test while 46 patients (25.55%) had abnormal Non Stress Test. In study conducted on similar subject, by Phelan et al [5], 85.4% had reactive Non Stress Test and 14% had nonreactive and 0.6% had unsatisfactory Non Stress Test. In Studies by Shrestha et al[6] and Panda et al[7] 10% and 14% had abnormal Non Stress Test respectively.

In this study, 60.4% patients had full term normal

delivery in normal NST group while 23. 91% patients had normal delivery in abnormal NST group. 33.58% patients had caesarean section in normal NST group and 63.04 % patients had caesarean section in abnormal NST group. This is comparable to study by Eden et al[8] where, caesarean section rate in reactive group was 23.2%, however in non reactive group caesarean section rate was lower as compared to our study i.e 37.7%.

Meconium stained liquor was found in 9.7% patients with normal Non Stress Test and 73.91% patients with abnormal Non Stress Test. In study done by Lohana et al[9], in reactive Non Stress Test Group, meconium stained liquor was present in 8.24% of reactive NST group which is comparable to our study while, in non reactive NST group the percentage of meconium stained liquor was 33.33% which is less compared to our study. The variation in gestational age of patients and number of post dated pregnancies can be accountable to the difference. The sensitivity and negative predictive value of the test for meconium stained liquor was 73.91% and 90.97 % respectively, which is comparable to study by Bano et al ([10]which showed negative predictive value to be 90.9%, and study by Khooshideh et al[11] which showed sensitivity of 62%.

APGAR score < 7 at 1 min was present in 4.47 % babies of normal Non Stress Group patients and 54.34% babies of abnormal Non Stress group patients. APGAR score < 7 at 5 min was present in 2.23 % babies of normal Non stress test group patients and 34.78% babies of abnormal Non Stress Test group patients. This was comparable to study done by Bano et al[10] which had APGAR<7 at 5min to be 3.4% in reactive group and 42.8 % in non reactive group.

For APGAR<7 at 5 minutes, the negative predictive value was 81.36% and specificity was 97.76% comparable to study done by Bano et al [10], with 98.8.% negative predictive value and 90.6% specificity respectively. The negative predictive value and specificity of APGAR<7 at 5 minutes is also comparable with the values of 95.23% and 83.33% respectively in study by Bhide et al[12]

4 babies (2.98%) were admitted to neonatal intensive care unit from normal Non Stress Test group and 18 babies (39.13%) from abnormal Non Stress test group. This is comparable to study by Bano et al[10], where, 3.6% babies were admitted from reactive nst group and 28.5% babies from non reactive Non Stress Group test.

Conclusion

Non stress test is a simple, noninvasive screening test which can be used to detect at risk babies in low pregnancies. It is easy to perform and the results are simple to interpret. It aids in early diagnosis of fetus with risk or hypoxia and helps in planning timely intervention. It is of great help in detecting meconium stained liquor with good precision. Non Stress Test is also a good predictor for babies with low APGAR score needing nicu facility so timely termination of pregnancies can be planned. Thus Non Stress Test is auseful tool to avoid obstetric litigation as parental expectation of a good outcome is extremely high.

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To Assess the Serum Vitamin D in Vitiligo Patients: SMHRC and AVBR Hospital of Vidarbha Region

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Abstract

Introduction: Vitiligo is a long-term skin condition that is characterized by skin patches which lose their pigment. The affected skin patches are becoming white and typically have narrow margins. The skin hair can also turn white. Mouth and nose inside might also be involved. Occasionally, the vitiligo "comes in families," implying a genetic origin. It ensures that the risk of other family members contracting vitiligo is not predictable. Approximately 25 to 50 per cent of people with vitiligo have a parent with vitiligo, and around 6 per cent have vitiligo siblings. Low serum levels of vitamin D have been associated with many autoimmune disorders and a number of other skin conditions. Vitiligo is an autoimmune disease which is characterized by immune processes that kill melanocytes. Melanocytes express vitamin D receptors, and vitamin D status can affect their function.

Objective: To assess serum Vit-D levels of vitiligo patients and contrast the outcomes and controls.

Material and Method: In all out, 50 vitiligo patients and 50 controls were taken on the examination. Vit-D levels were estimated from blood tests. Gathering correlations were performed utilizing fitting factual strategies.

Observation and Results: The patients had lower serum Vit-D levels than the controls, yet this distinction was not noteworthy ($p = 0.570$).

Conclusion: It stays obscure whether Vit-D inadequacy causes vitiligo. Bigger controlled investigations are required to demonstrate whether low flowing VIT-D is a causative factor in vitiligo.

Keywords: *Vitiligo, Vit-D, immune system illnesses, Etiopathogenesis.*

Introduction

Vitiligo affects approximately 2 percent of the world's population regardless of skin type, age and sex[1]. The malady may influence the two sexual orientations and all skin types[2] and may likewise be related with fundamental immune system sicknesses, for example, lupus erythematous, scleroderma, immune system thyroiditis and alopecia areata[3]. Diminished serum Vit-D levels are found in numerous immune system illnesses including foundational lupus erythematosus, diabetes mellitus, rheumatoid joint inflammation,

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different sclerosis and alopecia areata[4].Genetic factors play an important pathogenic factor. Multiple studies have included multiple genes in the pathogenesis of vitiligo, including studies on Jordanian population [5, 6].

Vitiligo has a significant psychological and social effect on individuals especially affected by women, or on exposed sites and more so in people of colour (POC) [7]. Vitamin D3 is a vitamin essential to humans. The majority of its active form is obtained by activating the pre-vitamin D3 formed in the skin following exposure to sunlight, in particular UVB (290–320 nm).Diet is only a minor vitamin source. This vitamin plays an important role in immunity (innate and adaptive), calcium control, and melanin synthesis; in addition, several diseases have been associated with decreased vitamin D levels. Melanocytes express vitamin D receptors which may indicate a possible role for vitamin D in melanocyte function regulation.[8].

Vit-D is a basic hormone that is orchestrated in the skin[9]. The dynamic type of Vit-D, 1, 25-dihydroxyvitamin D3, is a hormone that manages calcium and bone digestion, controls cell multiplication and separation and furthermore displays certain immunoregulatory capacities [10].Vit-D may influence both natural and versatile resistant reactions through receptors in T and B lymphocytes, macrophages and dendritic cells[11]. What's more, Vit-D3 increments tyrosinase action and melanogenesis by means of an atomic hormone receptor – the Vit-D receptor (VDR) in melanocytes[12]. Vit-D and its analogy are utilized to treat skin issue, including psoriasis and vitiligo[13]. Patients with vitiligo have been treated with topical calcipotriene [13]. Hardly any reports have examined the relationship among vitiligo and decreased Vit-D levels, yet these examinations give clashing outcomes [14,15]. Point: This examination expected to decide if patients with vitiligo have lower serum Vit-D levels contrasted with controls.

Material and Method

In all out, 50 patients determined to have vitiligo, in our outpatient division from 1 December 2013 to 31 March 2014, were taken a crack at the examination; 47 age-, sex and skin phototype-coordinated sound controls additionally took part. The patients were analyzed by a similar dermatologist and the analysis of vitiligo was made by clinical discoveries and a Wood's light assessment. Punch biopsy was performed on dubious cases, with the conclusion at that point checked. Point by point sickness and family ancestries were gotten from all patients. Different segment and way of life factors were recorded, including age, sexual orientation,skin model and sunscreen utilization. Members with liver or kidney issue, hyperparathyroidism, hypo-parathyroidism, any metabolic bone issue (for example osteoporosis or osteopenia) or fiery ailments were rejected from the investigation, similar to those taking Vit-D-or calcium-including drugs, or any fundamental or topical treatment for vitiligo inside the earlier month. Controls were selected from the accomplices or family members of patients, if not influenced by vitiligo, to limit contrasts because of dietary admission of Vit-D. Educated assent was acquired from all members and the neighbourhood Ethics Committee affirmed the examination, which was led as per the fundamentals of the Declaration of Helsinki. Blood tests were taken in the first part of the day after a base fasting time of 8 hour. Serum free T3, free T4, thyroid animating hormone, fasting glucose, against thyroid peroxidase antibodies, hostile to thyroglobulin antibodies, Vit-B12 and Vit-D levels were estimated.

Observation and Results

In complete, 26 (52%) guys and 24(48%) females were remembered for the investigation gathering. The benchmark group comprised of 30 (60%) guys and 20 (40%) females. The mean periods of the patient and control bunches were 31.96 ±10.68 and 32.45 ±9.52 years, separately. There was no huge distinction between the patient and controls as far as age ($p = 0.809$). All patients had summed up vitiligo as controlled by the nearness of reciprocal evenly circulated depigmented macules in trademark areas. The mean age at vitiligo macules beginning was 17.48 ±9.81 years. The term of the injuries extended up to 25 years. A family ancestry of vitiligo was accounted for in one patient. No patients had diabetes mellitus or Vit-B12 lack. Immune system thyroid ailments were accounted for in 14 (28%) patients. Vit-D levels were tried throughout months, from December 2019 to May 2020. The patients' serum Vit-D levels ran from 6 to 42 ng/ml (mean: 12.54 ±9.29 ng/ml); in the benchmark group they ran from 8 to 39 ng/ml (mean: 13.07 ±5.98 ng/ml). The patients had lower coursing Vit-D levels than controls, however this distinction was not critical ($p = 0.7352$).

Discussion

In the current investigation, we discovered lower

serum Vit-D levels in patients with vitiligo comparative with controls; be that as it may, this distinction was not huge. Both the patients and controls had exceptionally low circling Vit-D levels. This might be on the grounds that the blood tests were gathered during winter months. There are not very many examinations assessing serum Vit-D levels in vitiligo patients [14, 15]. Ustun et al. examined 25 vitiligo patients and 41 controls: deficient (< 30 ng/ml) or low (< 15 ng/ml) levels of Vit-D were seen in most of patients, yet the distinctions were not huge contrasted with controls [14]. These examiners expressed that countless examinations had announced low degrees of flowing Vit-D in immune system sicknesses; however it stays muddled whether this is a reason or consequence of immune system maladies [14]. Another examination researched 40 vitiligo patients and 40 age-and sexual orientation coordinated controls. Altogether lower serum Vit-D levels were found in the patient comparative with controls. The creators estimated on the chance of Vit-D supplementation for the treatment of vitiligo patients later on [15]. The pathogenesis of vitiligo remains to a great extent obscure. There are various hypotheses clarifying the pathogenesis of vitiligo, with all hereditary, immune system, autocytotoxic and neurogenic causes hypothesized. The immune system hypothesis is the best-bolstered one, since vitiligo might be related with other immune system sicknesses including malignant sickliness, hyperthyroidism, Hashimoto's thyroiditis, alopecia areata and adrenocortical disappointment. Besides, histological investigations have exhibited a high recurrence of cytotoxic T lymphocytes explicit to melanocytic antigens in vitiligo injuries, proposing an immediate, melanocyte-explicit T cell assault [16, 17]. Vit-D, which is a fat-dissolvable vitamin acquired by people through eating routine, is specifically compelling to dermatologists since it is combined in the skin by bright light. It has been utilized to treat psoriasis, vitiligo and other skin ailments for a long time [17]. The dynamic type of Vit-D, 1, 25-dihydroxyvitamin D3, directs calcium and bone digestion, yet in addition controls cell multiplication and separation and applies immunoregulatory exercises [13]. In a past report, it was accounted for those patients with comorbid immune system diseases are bound to have low serum Vit-D levels [16].Vit-D has anuclear receptor called Vit-D receptor (VDR). Vit-D receptors are available in the cells engaged with calcium and bone digestion, and furthermore in keratinocytes, melanocytes, fibroblasts and resistant framework cells of the skin. Polymorphisms in VDR are corresponded with expanded helplessness to numerous sclerosis, provocative entrail malady, rheumatoid joint pain and type 1 diabetes mellitus [19]. Vit-D applies a noteworthy impact on melanocytes and keratinocytes by means of different instruments. In vitro investigations have demonstrated that Vit-D3 is related with an expansion in tyrosinase action and melanogenesis [11], which may add to re-pigmentation in vitiligo macules. Vit-D analogs, including calcipotriol and tacalcitol, are known to improve re-pigmentation in vitiligo patients [20-22]. Another investigation announced that Vit-D applies immune-modulatory impacts by hindering the declaration of interleukin (IL)- 6, IL-8, tumor rot factor (TNF)- α, and TNF-γ [23]. Besides, it has likewise been indicated that the dynamic type of Vit-D lessens the apoptotic action prompted by UVB in melanocytes[13].

Conclusion

More investigation is required to outline the connection between VITAMIN D and vitiligo, to assess whether a low degree of serum Vit-D is a causative factor in vitiligo, and to learn whether Vit-D supplements are helpful for both the anticipation and treatment of vitiligo. Irreconcilable circumstance the creators proclaim no irreconcilable situation.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

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Immediate Effect of Buteyko Breathing in Hypertensive Patients: An Experimental Prospective Study

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Abstract

Background: There are ample studies showing effect of Buteyko breathing technique on cardiovascular parameters in asthmatics but very few studies have been done to see its immediate effect on hypertensive patients.

Aims: The aim of this study was to assess the immediate effectiveness of Buteyko breathing technique on hypertensive patients in terms of Systolic and Diastolic Blood pressure, Heart rate and Oxygen saturation (SpO2)

Method: The research design used was Experimental prospective study design. Total 50 participants were screened and those meeting the inclusion criteria (42) were included in the study. The participants were randomly divided into two groups-experimental and control Group, by computer generated randomised table into groups of 21 each. The experimental group performed the Buteyko breathing exercises. The control group did not receive any treatment. Pre and immediate post intervention scores were measured in terms of systolic BP, Diastolic BP, heart rate and SpO2.

Findings: On comparing the pre and post intervention values of the outcome measures, it was observed that there was statistically significant difference in Systolic BP, Heart rate and SpO2 values in Buteyko breathing group. No significant difference was seen in Pre and Post values of Systolic and Diastolic BP, Heart rate and SpO2 values in Control group. On comparing between the groups, it was observed that there was statistically significant difference between the two groups in terms of SpO2

Conclusion: Thus it can be concluded from the present study that Buteyko breathing technique has an immediate positive response on oxygen saturation level in hypertensives.

Keywords: *Hypertension, Buteyko breathing technique, SpO2, BP*

Introduction

Hypertension is defined as the persistent high blood pressure.[1] More than a billion people all over the world are affected with Hypertension[2] and it is anticipated that the number will increase to 1.56 billion in 2025[3,4] Globally, hypertension is the leading cause of premature deaths, with a rate of one in four men and one in five women.[5] For cardiovascular diseases, hypertension is one of the eminent risk factor. It is considered as a silent invisible killer as the symptoms are usually invisible in early stages until it takes a severe face later as of stroke, heart attack or chronic kidney disease.[2]

The Buteyko breathing technique named after its creator Dr. K P Buteyko was devised in 1950's.[6] It was basically developed to treat the asthmatics for hyperventilation. The beauty of Buteyko breathing technique is that it is easy to understand and patients can perform the exercise comfortably. It is a distinctive

breathing technique that utilises the breath holding and breath control exercises. This technique weighs more on shallow breathing pattern, correcting the hyperventilation. Thus basically it aims its attention on nasal breathing and holding the breath along with relaxation. The technique stresses on the optimum retention of CO2 which in succession has vasodialatory effect, resulting in the reduction in heart rate and blood pressure.[7]

There are several studies claiming successful effect of Buteyko breathing technique on Bronchial Asthma. A randomised control trial on Buteyko breathing technique as an addition to conventional treatment showed 39% increase in asthma control.[8] A similar study showing effects of Buteyko breathing technique on asthmatics revealed positive results.[9]Aslo there are a few studies showing immediate effect Buteyko breathing technique on Cardiorespiratory parameters in healthy adults[7], but to the best of our knowledge no study has been done to see the immediate effect of Buteyko breathing technique on cardiorespiratory parameters in Hypertensive patients. Thus the aim of our study was to evaluate the effect of Buteyko breathing technique on Blood pressure, heart rate and SpO2 in Hypertensive patients.

Methodology

The aim of the study was to assess the effect of Buteyko breathing technique on hypertensive patients.

Study Design:

Research Design: Experimental prospective study.

Sample Population: Hypertensive subjects residing in Nagpur region above 40 years of age.

Sample size: 50

Type of sample: Convenience sampling

Source of sampling: Nagpur district and outskirts

Place of study: Datta Meghe College of Physiotherapy

Duration of study: 1 month

Inclusion criteria:

1. Males and females clinically diagnosed with hypertension.
2. Age group -above 40 years
3. Patients with history of Coronary artery bypass grafting or angioplasty in the past 20 years.
4. Patients with addictions like alcohol, tobacco.
5. Patients having history of diabetes and thyroid.
6. Patients engaging in mild physical activity on daily basis.
7. Patients who have taken or are taking medications for hypertension.
8. Patients with a history of respiratory disorders but currently stable.

Exclusion Criteria:

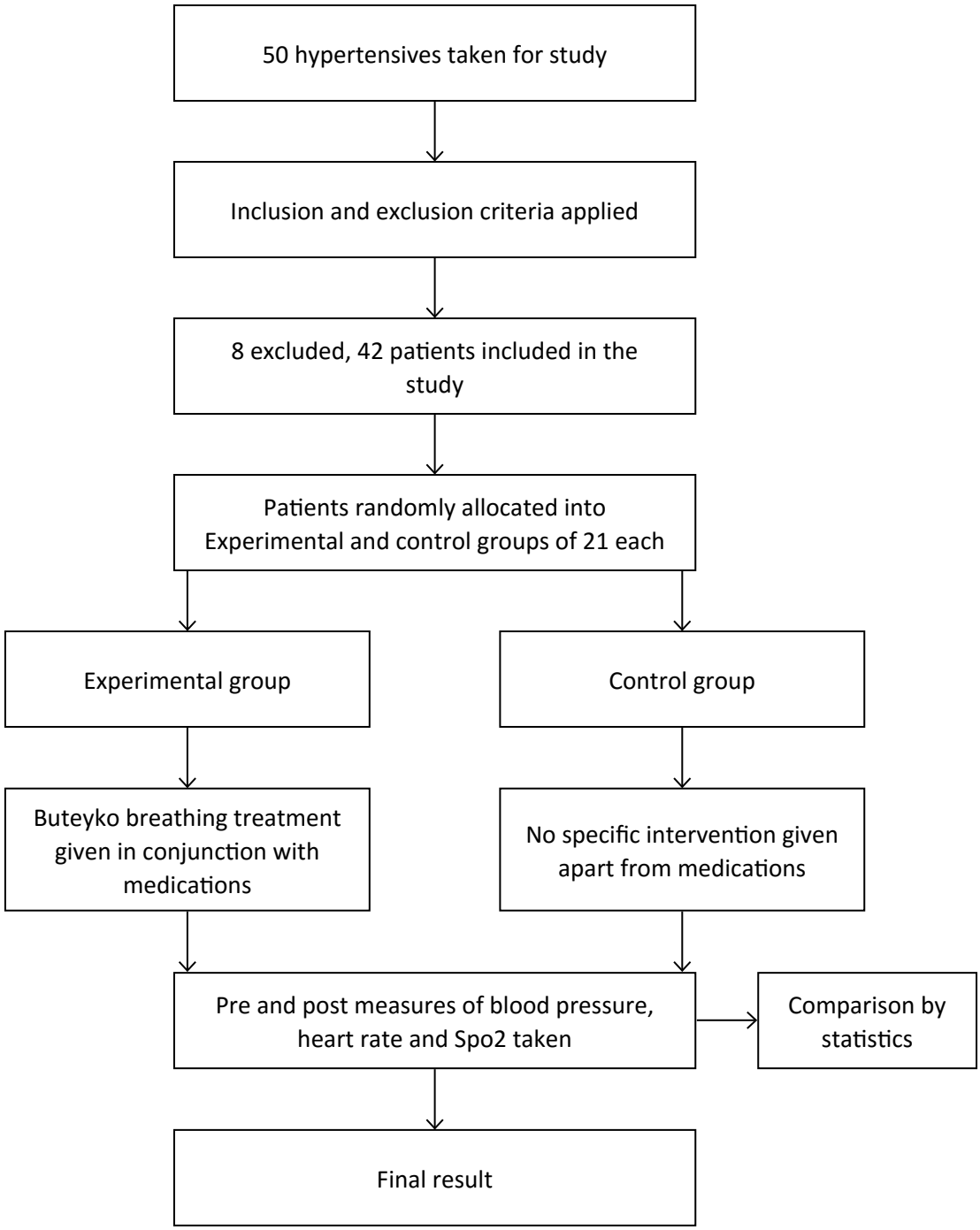
1. Patients with active respiratory infection or kidney problems.
2. Cognitively unstable hypertensive patients.
3. Patients unwilling to cooperate in the study.
4. Patients with a history of organ transplant.
5. Patients undergoing any cardiac or respiratory rehabilitation program.

Materials used: Digital B.P. apparatus, Pulse oximeter

Outcome measures: Blood pressure, Pulse rate, Oxygen saturation

The study was carried out at the Datta Meghe College of Physiotherapy, Wanadongri Nagpur. Ethical approval was obtained from Institutional Ethical Committee & an informed consent was obtained from the participants. 50 patients with hypertension residing in Nagpurregion were included in the study. The study was conductedfor a month. Inclusion and exclusion criteria were applied and 8 patients were excluded from the study. The study was conducted on 42 hypertensives fulfilling the inclusion criteria. The participants were randomly divided into two groups-experimental and control Group, by computer generated randomised table into groups of 21 each.

The Experimental group was given Buteyko Breathing technique.



A Digital B.P. apparatus and Pulse Oximeter were used in the study to measure Systolic and Diastolic Blood pressure, Heart rate and oxygen saturation. The blood pressure, heart rate and SpO2 of the patients were measured before the Buteyko technique. The technique was explained through video and audio to the patients and the patients were made to perform it. Immediately after the technique, the post reading were taken. The control group did not receive any treatment . The pre and the immediate post reading of the blood pressure, heart rate and Spo2 was taken in this group aswell after a 5 min interval.

Buteyko technique:

Step 1: Control pause phase:

The patient was asked to sit upright in a chair and breathe normally through the nose for 30 seconds (keeping mouth closed)

Subsequently instructions were given to the patient:

- Do not change your breathing pattern before taking control pause.
- Take a small breath in and a small breath out.
- Hold the nose on the "out" breath, with empty lungs but not too empty. (In order to prevent the air to enter the airways)
- Count for how many seconds you can last comfortably before need to breathe in again.
- Hold breath until feeling the first urgency to breathe in.
- Release nose and breathe in through it.
- First intake of breath after the CP should not be greater than the breath prior to taking measurement; patients were advised not to hold breath for too long as this may leadto taking a deep breath after measuring the CP.

Step 2: Shallow breathing

The patient were asked to:

- Sit up straight.
- Observe the air flow through the nostrils by placing a finger under the nose in a horizontally
- The patients' finger should lie just below the nostrils so that the airflow can be felt, but at the same time not blocking the airflow.[10]

Step 1 and 2 were repeated for 5 mins or 6 cycles approximately.

Once the pre and post measures of Blood pressure, heart rate and Spo2 were obtained, the statistics of the respective outcome parameters were calculated on the basis of SPSS software.

Result

The software MYSTAT 12 was used in this study. Outcome measures used were systolic and diastolic blood pressure, heart rate and oxygen saturation. Descriptive statistics such as mean and standard deviations were calculated to describe all the variables. The paired t-test and the unpaired t-test were used to verify differences between pre- and post-intervention. The statistical analysis was conducted at 95% confidence level, and $p<0.05$ was considered statistically significant.

The gender ratio was 12:9 (12 females and 9 males) in Group A and 11:10 (11 females and 10 males) in Group B. The difference in the mean age of both the groups was statistically not significant. (Table 1).

Table 1. Baseline demographic data of both the groups

Group	Group A Buteyko	Group B Conventional	t value	p value	Inference
Age (Years)	60.57 ± 8.50	60.71 ± 10.54	2.02	0.96	Not significant
Gender ratio (M:F)	12:9	11:10			

On comparing the pre and post intervention values of the outcome measures, it was observed that there was statistically significant difference in Systolic BP, Heart rate and SpO2 values in Buteyko breathing group. No significant difference was seen in Pre and Post values of Systolic and Diastolic BP, Heart rate and SpO2 values in Control group. On comparing between the groups, it was observed that there was statistically significant difference between the two groups in terms of SpO2 whereas no statistically significant difference was found between Systolic and Diastolic BP and Heart rate. (Table 2).

Table 2: Mean and SD scores of Buteyko and Control groups, Pre intervention and Post intervention

	Buteyko Group A				Conventional Group B				Between groups	
			Paired t test				Paired t test		Unpaired t test	
	Pre intervention Mean ± SD	Post intervention Mean ± SD	Mean Difference	p value	Pre intervention Mean ± SD	Post intervention Mean ± SD	Mean Difference	p value	p value	Inference
Systolic BP	139.57±23.48	126.00±28.44	13.57	0.002	139.57±22.82	19.42±20.83	0.14	0.79	0.08	Not Significant
Diastolic BP	83±12.51	84.42±6.86	-1.42	0.59	82.85±12.95	82.71±12.75	0.14	0.32	0.59	Not Significant
Heart rate	79.28±13.81	75±11.21	4.28	0.001	79.28±13.81	79.14±13.52	0.14	0.08	0.28	Not Significant
SpO2	97±1.22	98±1.44	-1	0.0001	97±0.94	97±1.09	0.00	1	0.01	Significant

Discussion

Table 2 shows the Pre-Post immediate effect comparison of Experimental and Control group. In data analysis, paired t test was applied for intra group comparison and unpaired t test was applied for intergroup comparison. On the basis of intra group comparison it can be said that there are positive changes of Buteyko breathing technique on Systolic blood pressure, heart rate and oxygen saturation in hypertensives. The results for the inter group comparison, showed a significant difference with Buteyko on SPO_2 (p value 0.01) as compared to the control group and thus it is seen that Buteyko technique has an immediate effect on increasing the SPO_2 level in hypertensive subjects.

Following could be the some of the reasons for the above results. According to the study by Yosreah et al(2019) titled "The effect of Buteyko breathing technique among patients with bronchial asthma: Comparative study" the major component of the Buteyko 'package' is to reduce hyperventilation through bouts of controlled reduction in breathing, known as 'slow breathing' and 'reduced breathing', combined with bouts of breath holding, known as 'control pauses' and 'extended pauses.'[10]

The Buteyko method is based on the concept that hyperventilation is the underlying cause of variety of medical conditions (Rosalba Courtney, 2008.) One possible biochemical mechanism of Buteyko may be through its influence on nitric oxide (NO). NO is involved in avarious of physiological responses including bronchodilation and vasodilatation[12]

According to Richa et al, Buteyko performed for 5 min at rest showed a significant increase in heart rate and reduction in systolic blood pressure, which is a normal physiological response. But however,they have notnoted any immediate changes in cardio respiratory parameters in the instances 'sub maximal exercise with Buteyko' and 'sub maximal exercise without Buteyko'.As also seen Review of the 'Australian government rebate on natural therapies' for private health insurance is is stated that there is no evidence about Buteyko Breathing Technique improving pulmonary function in adults. The reason for this can be that deep inspiration that is required to perform a lung function test might lead to bronchoconstriction and override any beneficial effect from the Buteyko breathing technique. This can explain the no significant change in diastolic Blood pressure and heart rate[7]Ritu et al(2013) stated that Buteyko breathing exercise is useful in management of respiratory rate and heart rate in chronic obstructive pulmonary disease patients[13,14]

Apart from this, it is also mentioned in studies that holding the breath can cause accumulation of carbon dioxide[15,16,17] that will lower blood pressure, as also breath holding will also improve the collateral ventilation which can be effective reasons for reduction of blood pressure, heart rate and improvement in SPO_2 in some patients. Thus these can be the reasons of the improvement in SPO_2 and reduction in systolic blood pressure in hypertensive patients in the study[18,19]. Also, since the immediate effect only was seen in the study, that can also justify why the diastolic blood pressure and heart rate was not significantly affected. The limitation of this study can be that it was a single intervention based study. Also it is recommended to use a larger sample size in further studies.

Conclusion

It can be concluded from the present study that Buteyko breathing technique has an immediate positive response on oxygen saturation level in hypertension.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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Osteometric Evaluation of Human Skull for Sex Determination: A Comparative Study

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Abstract

Background: Sex determination from analysis of bony remains is one of the most important arduous job for medicolegal experts, especially in cases where identity of the deceased person is in question. Aims & objectives: Our study focuses on evaluation of different osteometric parameters of skull which will be helpful for sex determination.Material and Method: Current study was conducted on 60 human skull bones & they were studied by using calipers for various osteometric measurements. Results: In our study we observed that, skull length, interorbital breadth, biorbital breadth, maxillo-alveolar breadth, maxillo-alveolar length, bizygomatic breadth & nasion-prosthion length are the statistically significant variables & are good determinants for sex than rest of the parameters. As compared to them, cranial breadth & orbital height are poor parameters for sex determination. Conclusion: Human Skull bone as a whole & it's different measurements taken from anatomical landmarks & their osteometric analysis is a good determinant for sex of an individual.

Keywords: *Human skull, cranial osteometry, human identification, bony remains.*

Introduction

There are many challenges, a medicolegal expert faces during his work & sex determination from bony remains is one of such a crucial task to establish an identity of the individual. Such condition arises in many cases like homicidal investigation, archeological interest, mass disaster (both natural & manmade), cases where there is violation of human rights etc. Current global sex ratio is 1.018, which implies that if we are well versed with the aspects of sexual dimorphism then we can reduce our search result to nearly half of the population[1,2]. If whole skeleton is available for analysis then, sex determination is extremely authentic. But in most of the cases, part of the skeletal remains or some bones or even in extreme cases parts of the bony fragments are available for examination. Now in such cases, there arises a need of studies of various skeletal elements of individual bone for determination of sex of that individual. From the past studies it has been well established that sex determination from examination of skull bone & its components has precision rate of almost 85-95%[3]. There is a long list of factors that determine & influence the characteristics of bony prominences which are useful for sex determination, especially during the adolescence. Generally boys have exceptionally vigorous growth surge as compared to girls in their adolescent age group[4]. Roughly there are two techniques for determination of gender from bones & their characteristics. They are: visual evaluation & osteometric method. Visual method is comparatively very easy to asses, does not require any instrument to asses but is highly individual specific & depends on the skill of the forensic expert (which is variable). While the osteometric method is more objective, reliable, depends on indices & is less dependent of investigator's

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subjective evaluation. It in turn reduces the bias between two individual experts which means the results obtained from this method are highly reproducible. Our investigation is done to evaluate the dimorphic features of male and female crania of Central Indian origin based on osteometric analysis.

Material and Method

Current study was performed on dry skull bones at Datta Meghe Medical College, Nagpur which is a part of Datta Meghe Institute of Medical Sciences University. Institutional Ethics committee gave approval for the same. Intact skull bones which are showing well defined sexually dimorphic characteristics on visual examination were involved in our research. Skull bones were taken from departments of Anatomy & Forensic Medicine of Datta Meghe Medical College, Nagpur & Jawaharlal Nehru Medical College, Sawangi. Skull bones which are showing inconclusive dimorphic characteristics on direct visual examination/incomplete skull bones or skulls having any bony deformity were excluded from our study. On the basis of our inclusion & exclusion criteria, we finalized a total of 60adult skull bones out of which 35 were of males & 25 were of females.After reviewing the past researches regarding skull osteometry, we took ten measurements into our consideration. All the measurements were taken using Vernier calipers & sliding calipers. Following anatomical landmarks were included: ecto-conchion, dacryon, nasion, eurion, zygion, prosthion, opisthocranion, glabella, basion, alveolon, opisthion, ectomolare.

Table 1: Following measurements were taken into consideration for our study:

Variable	Abbreviation	Distance between
Maximum Cranial Length	MCL	Opisthocranion & glabella
Maximum Cranial Breadth	MCB	both the eurions
Inter-Orbital Breadth	IOB	both the dacryons
BiorbitalBreadth	BOB	outer & lateral margins of orbital rims
Orbital Breadth	OB	lateral & medial border of the orbit
Orbital Height	OH	superior & inferior border of the orbit
NasionProsthionLength	NPL	Nasion & prosthion
BizygomaticBreadth	BZB	two zygions
Maxillo Alveolar Breadth	MAB	two ectomolares
Maxillo Alveolar Length	MAL	Alveolon & prosthion

Our obtained data was analyzed using statistical package for social sciences (SPSS) software. Student's t- test was applied to study the mean differences in various cranial parameters. P- value< 0.05 was considered as significant.

$$\text{Index of sexual dimorphism} = \frac{\text{Meanvalueinmales}}{\text{Meanvalueinfemales}} \times 100$$

Results

Table 2: Descriptive statistics for cranial parameters

Variable	Male (N=35)		Female (N=25)		p – value
	Mean	SD	Mean	SD	
BZB	10.08	0.49	9.44	0.51	<0.0001
BOB	9.86	0.57	8.88	0.5	<0.0001
OB	3.87	0.25	3.55	0.33	0.0001
IOB	2.31	0.24	2.52	0.31	0.0477
OH	3.21	0.28	3.2	0.31	0.2174
NPL	4.81	0.42	4.19	0.57	<0.0001
MCL	13.46	0.6	12.41	0.65	<0.0001
MCB	10.39	0.63	10.21	0.28	0.3257
MAL	6.46	0.36	6.06	0.45	<0.0001
MAB	5.28	0.39	4.96	0.31	0.0012

In present study mean Bizygomatic Breadth was found to be significantly higher in males. Both Biorbital breadth and Orbital breadth were higher in males but no significant difference was observed between males and females in Orbital breadth whereas Biorbital breadth in males was significantly higher compared to females. Similarly inter-orbital breadth in males was observed to be significantly higher in this study. Orbital height was found have insignificant difference and was much similar in males and females. Nasion-Prosthion length and Maximum Cranial length were noted to be significantly higher in males while maximum cranial breadth was insignificant although it was higher in males compared to females. Both MaxillOo-Alveolar Length and Maxillo-Alveolar Breadth were found to be larger in males significantly.

Calculation of sexual dimorphism indices revealed that Nasion-Prosthion Length was strongest determinant of sex followed by Biorbital breadth, Orbital breadth, Maximum Cranial length. Inter-orbital breadth, Bizygomatic breadth, Maximum alveolar length and maximum alveolar breadth also showed good degree of sexual dimorphism. Maximum crania breadth and orbital height are observed to be poor determinants of sex in our study.

Table 3: Sexual dimorphism indices.

Variable	Index of sexual dimorphism
BZB	106.78%
BOB	111.04%
OB	109.01%
IOB	91.67%
OH	100.31%
NPL	114.80%
MCL	108.46%
MCB	101.76%
MAL	106.60%
MAB	106.45%

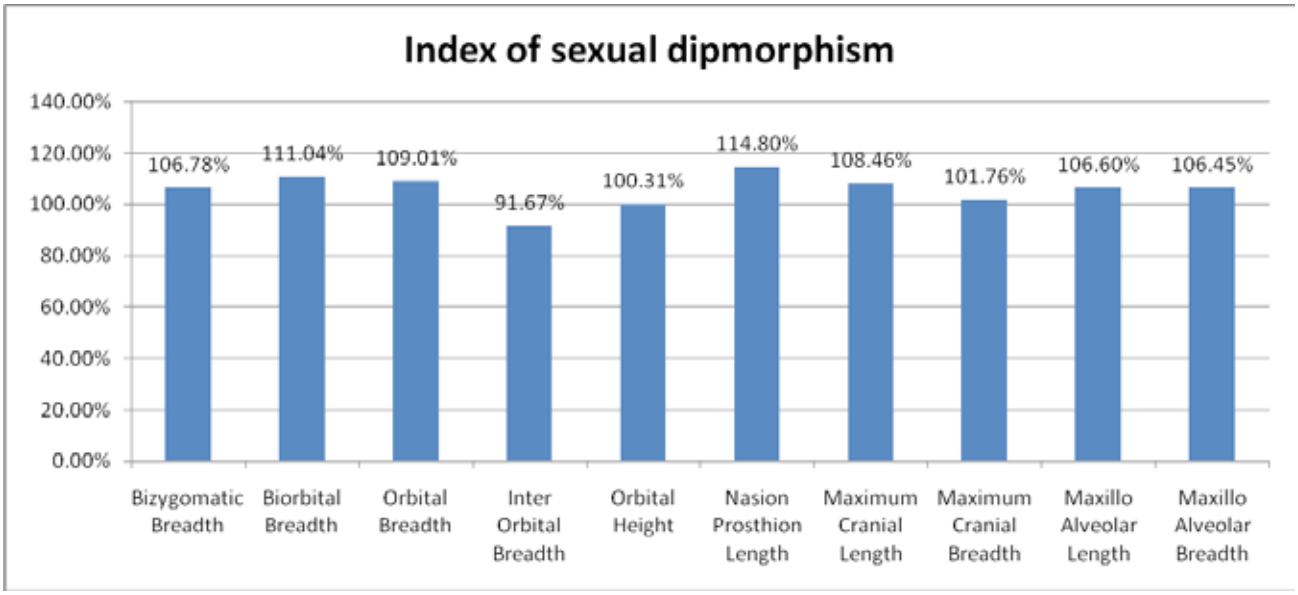

Figure 1: Graphical depiction of Sexual dimorphism indices

Discussion

In this study BB, BOB, IOB, OB, NPL, MCL, MAB and MAL were significantly higher in males compared to females. OB and MCB were found to be insignificant although they were comparative higher in males. The findings in our study are in agreement with study done by Gupta A et al.[5] The sexual dimorphism indices indicate that NPL is the strongest index followed by BOB, OB, IOB, and MCL. Also MAL, MAB, BZB are good at determination of sex while OH and MCB are poor determinants of sex from crania. These findings are similar reported to indices calculated by Gupta

A et al. When BZB, MCL, NPL were compared with study conducted bySteyn M et al[6] findings reported were similar and the parameters differed significantly among males and females. Steyn M et al. also reported that accuracy of prediction of sex from human skull was found to be 85.7%, which was highest among rest of the bony parameters which were analyzed in the same study. Thuangthong T et al[7] conducted a study on sex determination using computer aided software and compared those results with the findings obtained by conventional caliper method. In that study it was reported that OH and BZB differed significantly among both sexes. Also use of computer aided technique determined sex with greater accuracy as compared with use of conventional caliper method. A study done by Saini V et al[8]assessed various parameters for determination of sex among which BZB and BOB differed significantly similar to our study but in contradiction IOB was insignificant between both sexes. OH was insignificant in agreement to present study. Indices such as BZB(105.5), OB(103.295), BOB(103.251) in that study were not in agreement with indices found in our study BZB(106.78), OB(109.01) and BOB(113.04). Ramamoorthy B et al[9] conducted a similar study by using CT head scans of adult live subjects using various craniometric parameters (few of them are included in our study). They found out that accuracy for sex determination approximately ranged from 91.4% to 97.1% in multivariate analysis. Accuracy was highest when all variables were taken into consideration. The parameters which were similar in our study are in agreement with results obtained by Ramamoorthy B et al. Dayal M.R. et al[10] in their study reported that MCL, BZB, OB are significant while OH is not significant which matches to the results of present study. In the same study Dayal M. R. et al. reported that the accuracy of determination for sex is greater with mandible(85%) compared to that with cranium(80.8%). The findings in present study are in agreement with those in a study done by IscanM et al[11]in modern Japanese crania.

Conclusion: India is a diversified country with respect to climatic conditions, food habits, occupations, etc. With such a wide geographical variations, skeletal assortment to represent whole country is difficult. This study indicates the index for sexual dimorphism for various cranial parameters. In this study Nasion-Prosthion Length is observed to be strongest index for sexual dimorphism followed by Biorbital breadth, Orbital breadth, Interorbital Breadth and Maximum cranial length. These indices are useful for the population with similar groups. It is necessary to conduct more & more studies in geographically diversified population especially in different regions of our country on a larger scale so as to represent whole population as the results may not fully reveal true nature of sexual variation in parameters in a small sample size.

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Review on Utility of Antitoxic Preparations in Non-Poisonous conditions w.s.r. to Agadtantra

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Abstract

There are hundreds of formulations in the market, which are mostly prescribed by the physicians depending upon their knowledge about the general context of reference. Analysis of the ingredients and the phalshruti of each formulation give a clear picture about them and also help to make a better application in clinical practice. Nowadays, most of the diseases are caused due to unconventional etiology. When a disease is caused by unconventional etiology, it can be managed effectively by using principles of Agadtantra. Currently most of the diseases require Nirvishikarana (Detoxification), for this reason Antitoxic formulations mentioned under Ayurveda which contains singleantitoxicherb, combinationofanti-toxicherbs, herbs-minerals combinations etc can be very effective insuch unknown etiology diseasedconditions. Antitoxic preparations with Vishaharatwa(Antitoxic) property, as one of the action have a better effect in general diseases than other formulation. This review article places of interest in the significant role of antitoxic formulations mentioned in Agadtantra (Ayurvedic perspective of toxicology) to overcome diseases which are produced due to unknown etiology.

Keywords: *Antitoxic preparations, Agadtantra, Non poisonous conditions, Vishaharatwa, Nirvishikarana.*

Introduction

Ayurveda an ancientIndianSystemofMedicine has principal scopethataretomaintain the good health and to cure the diseases or pathological conditions. In Ayurveda, Health is defined as the state of equilibrium of Doshas (Bio energetic humors), equilibrium in Agni (The governing processofdigestivesystem), equilibriuminDhatus(bod ytissues) and normal expulsion of Malas (wastes like feces, urine, sweat etc.)withstateofpeaceinAtma(soul), Indriya(senses)andMana (mind)[1] According to Modern Science, basically it is the phytochemical constituent in the herbs which leads to desired healing effect, such as saponins, tannins, alkaloids, alkenyl phenols, flavonoids, terpenoids, phorbol esters and sesquiterpenes lactones. In the management of general diseases or poisoning, Ayurveda focus on Equilibrium of Dhatu by maintaining equilibrium in Dosha and Agni with the help of various single herb or combination of herbs (Poly herbal formulation) or combination of herbs-minerals. The principle behind any formulation of Ayurveda in any disease or poisoning condition is to correct Agniandvitiation of Doshasviz. vata, pitta and kapha which may be seen in that specific disease or poisoning condition. In the management of visha, the primary focus is to remove visha before it has chance to harm Dhatu and ojus. In case of sthavara, we have an opportunity to eliminate by vamana or virechana. As jangamavisha is directly entered into rakta, it spreads quickly and damage the Dhatu much faster .Here we want to hurry to make sure quick paka of visha before this happens

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and for that ushna, teekshnadravyas are essential to be introduced though they are similar to visha in properties. In the detoxification of visha and containment of vata, ushnapradhan agada has a significant role. At this stage, we should remember the other side of the truth. As the properties of pitta and visha have common characteristics significantly, the pakaof ofvisha in pittapradhanvisha is enabled only with shita and tiktapradhandravya. Like sariva and chandana. Thus it is natural finding that some pittaharaaushadhis are also having vishahara property.

Many diseases are characterized by a component of something that refuses to undergo paka or digestion. This apaki component gives such diseases resemblance of vishajanyavyadhi . Normally a disease is managed with drugs that have qualities opposite to those that caused the disease. In diseased condition with higher visha component, we make use of another visha instead of employing the viparitguna. This exception becomes inevitable because the vyavayi and vikasigunas of the vyadhikarakvishdravya can be matched only by another vishadravya. The notable point here is that the vishadravyaemployed as a drug, even if ushna, doesn't aggrevate the potency of vishadravya that caused the disease. Even in the formulation of vishaharayogas. Teekshna and ushnagunas are dominant. With this understanding of the dynamics of visha and vishachikitsa, we can try to analyse the application of this management of diseases not caused by the visha.

The word Agada is derivative from Gada. Gada has two meanings one is Roga (Disease) and the other is Visha (poison). Agadaisadrug that conquers disease or poison. In Ayurvedic Samhitas various single herb, poly herbal formulation or herb-mineral formulation are mentionedasAntitoxic. Accordingly, single herbs or poly herbal formulation or herb-mineral formulations are used in that disease or poisoning condition. Physician can also change combinations, forms, vehicle of these formulations as per vitiation of Doshas in the patient ordisease. Charakacharya mentioned Vishghnamahakashaya which includes ten Vishghnadrugs[2] Drugs which act against these qualities of toxic substances are called as Vishghna (Antitoxic). Drugs mentioned under, work due to their Raspanchak antagonist to Visha (poison) and helps in the management of diseases.

Vishghna Mahakashaya contains:

1. Haridra (Curcuma longa)
2. Manjishtha (Rubiacordifolia
3. Suvahaa (Pluchealanceolata)
4. Sookshamaelaa (Elettariacardamomum)
5. Paalindee (Operculinaturpethum)
6. Chandan (Santalum album)
7. Kataka (Strychnospotatorum)
8. Shireesh (Albizzia lebbeck)
9. Sinduvaara (Vitex negundo)
10. Shleshmaataka (Cordia dichotoma).

Drugs which act against toxic substances are called as Vishaghna (Antitoxic). Some Vishaghna drugs act by Dravyaprabhava (virtue of their own nature), some drugs act by Gunaprabhava (by virtue of their properties) and some drugs act by Dravya Gunaprabhava (virtue of their nature as well as properties. These Vishaghna Dravya (Antitoxic herbs) and Vishaghna Yogas/Agadas (Antitoxic formulations) are used in various poisoning and diseased condition. Most of these antitoxic formulations acts as Raktashodhaka (Blood purifier), Tridoshaghna (causes equilibrium in body humors), Hridya (Cardio protective) and Ojavardhaka (Rejuvenate). Sushrutacharya has mentioned 95 antitoxic drugs in different Gana (Group) like Aaragwadhadi Gana (20), RodhradiGana (13), Arkadi Gana (14), Shyamadi Gana (19), Patoladigana (07), AnjanadiGana (8), Utpaladigana (7), Trapvadi Gana (7) in the chapter 38 Dravyasamgrahaniya of Sootrasthana[3]. Twenty antitoxic drugs are also mentioned in EkasaraGana in SushrutaSamhita[4]. AshtangHridaya describes 104 antitoxic drugs which are listed in Gana like AnjanadiGana (9), Patoladi Gana (6), Aaragwadhadi Gana (20), Rodhradi Gana (13), ArkadiGana (14), EladiGana (24) and ShamadiGana (18)[5]. These antitoxic drugs can be used singular or in combination with other drugs mentioned in that specific Gana. VishaghnaYogas (Antitoxic formulations) like Kshara agada[6], Dooshivishari Agada[7], BilwadiGulika[8], Maha agada[9], Ajita Agada[10], Sanjeevana Agada[11] etc. are described in Ayurvedainparticular poisoning as well as in diseased conditions with unknown etiology.

Some Antitoxic Formulations and their Mechanism of action:

1. **Bilwadi Gutika:** Most ingredients of Bilwadigutikahave ushna and teekshnaguna and pachana karma . The phalshruti includes almost all

jangamavisha, jwara, garavisha, ajeerna, visuchika .One safe interpretation is that this yoga corrects apakwa in rasa Dhatu and regulates vata. Clinically it has an extended efficacy in conditions like atisara, chardi and jwarawhrere ama is predominant.In psychiatric illness as well as somatic illness that affect the mind, with an appropriate anupana, this gutika stabilizes the mind.

2. **Kalyanaka Ghrita:** In the kalyanakaghrita described in Ashtanghridaya, Visha is an indication. Its specific utility is to produce hridayavarana in jangamavisha . Now most physicians use this yoga in manovyadhichikitsa. In comparision to Bilwadigutika, ushna and teekshnadravyas are less in Kalyanakaghrita and Tiktakaghrita. These two yogas execute their pachana karma more due to the vayu and aakash in the tikta rasa dravya and less due to the tejbhuta in the katu rasa dravyas.

3. **Aargwadhadikashay:** Aargwadadikashaya is generally employed kaphapittajanyavikaras. We all know its efficacy to reduce the dushtamedas . Its antitoxic property is one reason why it is particularly effective in dushtavrana and kaphajaprameha.

4. **Dhanwantaraghrita:** Even though this drug is mentioned in pramehaadhikara, the indications also include visha, gara, kushtha The majority of ingredients have ushna and teekshna property which makes it useful in pachana karma in the above mentioned diseases.

5. **Sanjeevani Vati:** The indication of this drug is mentioned according to its dose. It is indicated in minimum dose for ajeerna whereas an increased dosage for sanyasa and visha. This means the action of this drug is according to the pachana karma.

6. **Patolkaturohinyadikashayam:** This is mainly indicated inkaphapittapradhan diseases. It can be used in lutha Visha, Pittapradhan Visha and visarpa. It is used in this condition because of its rechana property.

Discussion

The current circumstances of world facing many health issues and occurrence of communicable diseases (Sankramaka Roga) are predominantly causing health problems. Acharya Charak mainly described the concept of Janpadodhwans as Sankramakroga, Aupasargikrogas which multiply from person to person, which resembles population demolition in an area. In current scenario, such types of diseases creating great health trouble since large number of global population affected with pathogens. The toxins; endotoxins or exotoxins releasedby microbial agents initiate pathogenesis of diseases.[12, 13, 14] The modern science has also mentioned some diseases which spread from person to person and occurs due to the microbial infections. These are huge challenges & creating a trouble over health care system, it is advised to include the use of Ayurvedatreatment.

Physical fitness of the people is deteriorating day by day duet ode forestation, globalwarming, indiscriminate use of pesticides-fertilizers in the farming, food adulteration, incompatible food, food additives-preservatives- sweeteners, increasing pollution levels, industrial emission, hormonal administrations in poultry-dairy, indiscriminate use of various synthetic drugs etc. In present circumstances, most of the diseases are caused due to unconventional etiology. For this unconventional etiology due to toxicants/chemicals Agadtantra focuses on ViruddhaAhar (Incompatible diet), GaraVisha (Artificial poison) and Dushivisha (polluting poison). All these toxicants/chemicals in the form of Viruddhaahara or Garavisha or Dushivisha enters into the human body by different routes and responsible for various. According to Ayurveda, diseases are produced due to imbalance of Dosha (Body Humors) and Dushya/Dhatu (Body tissues)[15]. Poison first vitiates the blood, then vitiates the humors Kapha, Pittaand Vatainsequencealong with their substrata, proceed to heart and then become fatal[16]. Vitiation of Doshas is very important factor in the production of both diseased and poisoning condition. Only difference is in the case of poisoning it vitiates blood first then body humors. Diseases caused by Viruddha Ahar, Garavisha and Dushivisha have same principle of management that is Shodhana Chikitsa (Eliminationoftoxins)by induction of emesis or purgation before using antitoxic formulations. As antitoxic formulation act as bloodpurifier, causes balance in body humors viz. vata-pitta- kapha, helps in rejuvenation, it reverses the action of poison and helps to become free from poison. These antitoxic formulations are useful in diseases caused by incompatible diet, artificial poison and pollutant poison. Therefore antitoxic preparations help to get better health status and longevity of the humanbeing. Ayurveda explains good health by using wholesome diet, lifestyle and natural remedies prepared from medicinal plants and minerals. Modern science generates the theory of balance between free radicals and antioxidants to maintain the goodhealth.

The diet which provokes bio energetic humors without eliminating them is considered as Viruddha Ahara[17]. Drugs and food materials incompatible with the normal body tissue elements are Viruddha[18]. Viruddhaahara generally do not have any effect on those who are habituated to it or consume it in a small quantity, their Agni (Digestive power) is strong and who are young and practicing exercise regularly[19]. Incompatible food like Garavisha (Artificial or synthetic poison) may beone of the reasons of several diseases anddeath[20]. For prophylaxis of these diseases, Ayurveda emphasizes on prohibition of incompatible food. Diseases caused by incompatible food may be treated with emesis, purgation, by using the drugs which act opposite to that particular disease and wholesome diet[21].

In current era, knowingly or unknowingly we the people are exposed to various types of poisons which may be of natural or artificial origin. Gara is the combination of substances, non poisonous or poisonous which exerts toxic effect after interval of sometime and as such does not kill the patient instantly. Low potency this poisons of artificial origin called as Garavisha after sometime it act as Dushivisha. Dushivisha becomes symptomatic when storage of chemicals/toxins get the rate of exposure is greater than rate of metabolism or excretion. Ayurveda explains this concept of accumulation of toxin in the body under the concept of Dushivisha. As Dushivisha is less dangerous it does not cause any immediate clinical features and lies inactive in the body for some years. . In current era diseases with unknown etiology are increased due to incompatible food, unhealthy lifestyle, exposure to toxic substances, pollutants, chemicals and drugs. In this condition, Dietetic foods and traditional herbal medicines work effectively. In the case of any formulation, it goes without saying that the clinical conditions indicated in the phalshruti will have atleast one common component of samprapti that threads through them. Apakwavastha is the key factor in all vishajanyavikaras. Similarly, the clinical success of the antitoxic preparations in jwara, pandu, ajeerna and visuchika points towards the common factor namely apakwavastha in rasa Dhatu.

Conclusion

Though Vishahraaushadhis (Antitoxic preparations) have many advantage to cure diseases, should not, need not and cannot be used in the management of common diseases. Only when the nidana, samprapti and lakshana is indicative of visha or vishasamancomponents, should we suggest the superior clinical contribution a vishaharaaushadhi is likely to make. In any common disease, we may identify a component or stage of the samprapti to be vishasaman. That would be the right time to employ Vishaharaaushadhis.

Nowadays, Agadtantra is the branch of Ayurveda is unnoticed due to less use in clinical practice by expert Ayurvedaphysicians . Most of the diseases caused in present scenario are due to unconventional etiology such as indiscriminate use of pesticides-fertilizers in the farming, food adulteration, food additives-preservatives-sweeteners, indiscriminate use of various synthetic drugs etc. For this unconventional etiology, In Ayurveda Agadtantra insist on Virudha Ahar (Incompatible diet/ food), GaraVisha (Artificial poison) and Dushivisha (Polluting poison). Oxidative stress can be correlated with the concept of Virudhaahar, Garavisha and Dushivisha. This unknown etiology causes diseases like cancer, cardiovascular disorders, neurological disorders, liver disorders, renal disorders, psychological disorders, skin diseases etc. For the management of such diseases of unknown etiology, routine drugs/treatment may not behelpful. Now it's time to explore and use the principles of Agadtantra with Antitoxic formulations not only to poisoning conditions but also in various diseases and pathological conditions to improve health status and longevity of human being. According tot he ideology of management in Agadtantra, in current era most of the disorders require, Detoxification, Elimination of Toxins, Blood purification, Equilibrium in body humors, Rejuvenation therapy. Anti- toxic formulations help in detoxifications. Thus, these anti toxic formulations mentioned in Agadtantra will be useful for society in the disorders of present scenario. Additional Preclinical and Clinical study have scope in this regard.

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Reference

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