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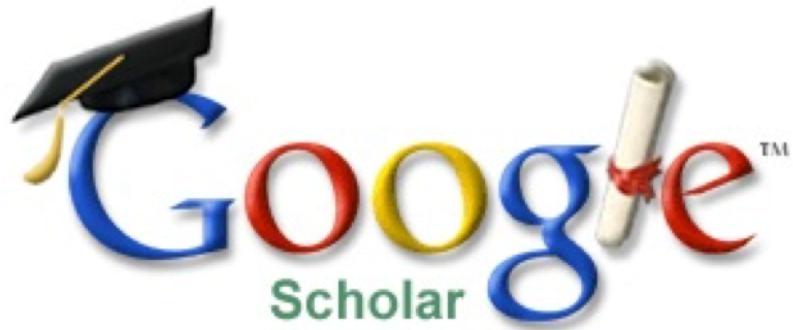
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INDEXED IN



Use of Neuromodulatory Approaches in Stroke Rehabilitation

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Cardiovascular diseases such as stroke are one of the leading causes of death and disability in the world, and that number is likely to increase in the coming decades.¹ Besides the conventional physiotherapy² there is still no effective treatment for several motor function disabilities. The patients remain with motor disabilities for the rest of their life. The developments of more effective treatments for these patients are one of the most critical goals for science today.³

The development of neuromodulatory interventions to induce neural plasticity is advancing at a rapid pace. The concept of neuromodulation is based on evidence that the Central Nervous System (CNS) can exhibit neuroplasticity that is enduring beyond the stimulus.⁴ There are some different non-invasive neuromodulatory paradigms already described in the literature, including, Transcranial Magnetic Stimulation (TMS), repetitive TMS (rTMS), and transcranial Direct Current Stimulation (tDCS).⁵ Paired Associative Stimulation (PAS) paradigms have been described that utilize an exogenous stimulation of the cortex repetitively paired with an exogenous peripheral nerve stimulus [6]. Peripheral electrical stimulation that provides an afferent input to somatosensory cortical projections, combined with a firing of cortical neurons has been utilized in PAS protocols to induce LTP by colliding a sensory input and motor output.^{6,7,8,9} In these PAS protocols, cortical stimulation is most often induced using TMS as a non-invasive exogenous method of exciting the motor cortex. Peripheral electrical stimulation over a peripheral nerve

which receives afferent information from the muscle of interest is used as the peripheral sensory input. Around 100-200 pairings of peripheral and cortical stimuli are delivered in most PAS paradigms and result in increased cortical excitability that outlasts the length of the stimulus to the extent that cortical excitability remained increased for at least 30 minutes following the intervention.^{6,10} The timing of each stimulus in the pairing is important, if the peripheral afferent volley arrives at the cortex around the same time that the TMS is delivered then excitability in the cortex is increased. Conversely, if the afferent volley arrives around 10ms before the cortical stimulus, there is a decrease in cortical excitability.^{6,10,11} There is some indication that the precision of timing may not be as stringent in the lower limb as it is in the upper limb, with a wider inter-stimulus interval difference for interventions that increased lower limb related cortical excitability being wider than the equivalent for the upper limb.¹²

Another emerging approach for stroke rehabilitation is Brain-Computer interface (BCI). Since the first brain-computer interface was described in the 1970s by Jacques Vidal, several studies have shown that there is a vast variety of use of how a BCI system can be used. The first published work, showing that using a Brain-Computer interface (BCI) system could modify the organization of the brain was done on monkeys in 1996 by Iriki et al.¹³ and hence has the possibility improve motor function in humans as well. A BCI is a system that interprets brain signals generated by the person, allowing

commands from the brain to be sent to an external device.

The combination of new rehabilitation paradigms, such as paired associative stimuli (PAS), which exploit cortical plasticity, with BCI's represents a novel application of this technology in people with neurological diseases. One possible way of doing that is that the BCI identifies the movement related cortical potential (MRCP) in the participants own electroencephalography (EEG) and uses this to trigger a PAS protocol that converges a peripheral afferent stimulus with the person's efferent output. The Movement-Related Cortical Potential Paired Associative Stimulation (MRCP PAS) intervention is a novel neuromodulatory paradigm that uses an endogenous cortical signal to provide the efferent output paired with an exogenous peripheral nerve stimulus and shows promise as a neuromodulatory intervention. The use of the MRCP as an endogenous signal within the MRCP PAS protocol has been studied in different conditions in healthy people and those with stroke. This MRCP BCI intervention has the potential to contribute to improved outcomes for people with stroke and to provide a cost-effective, sustainable intervention that can be implemented in rehabilitation facilities, hospital and private clinics.

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Effects of Static Stretching in Comparison with Muscle Energy Technique in Treatment of Non-Specific Neck Pain

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Author's Contribution

¹Data analysis, ^{2,3}Conception, synthesis

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ABSTRACT

Background: Neck pain is the one of the most common musculoskeletal problem and most of the neck pain non-specific in nature which means that a pain that originates from poor neck posture and mechanical strain. It involves any area between upper cervical and upper thoracic spine.

Objective: The purpose of this study is to evaluate the effectiveness of Muscle Energy Technique and static stretching on pain and active cervical range of motion ROM in the treatment of non-specific neck pain.

Methodology: This interventional study was conducted at physiotherapy department Mayo hospital Lahore Pakistan from September 2015 to February 2016. There were two groups and each group was allocated with 22 patients. Group A received static stretching of neck muscles and Group b received Muscle Energy Techniques. Patient included in both groups have to age between 18 and 60. Neck Disability Index (NDI) was used in this study.

Results: Paired sample t-test was used for analysis. Statistically significant improvement is found in both groups as the p value is <0.005.

Conclusion: The result shows both the treatment techniques, muscle energy technique and static stretching were effective in alleviating the non-specific neck pain in terms of decreasing pain intensity and increasing active cervical range of motion as there was no significant difference between the two groups, however MET was superior than static stretching in decreasing pain intensity and increasing active cervical range of motion.

Introduction

Neck pain is one of the most common musculoskeletal problems and most of the neck pain is non-specific in nature which means that a pain that originates from poor neck posture and mechanical strain.¹ It involves any area between upper cervical and upper thoracic spine.² Neck pain is characterized by a sensation of hyperalgesia in the skin, muscles, and ligaments. Neck pain is the commonest site of non-traumatic musculoskeletal pain.³ The prevalence is highest in middle age, roughly 71% of elderly has neck pain.⁴ It is found more in females and prevalence of neck pain has an increasing trend up to 50 years followed by a decline.⁵ There is a low prevalence of neck pain in European and

Asian countries than in Scandinavian countries.⁶ According to Binder, neck pain can be: acute (<4 weeks duration), sub-acute (1-4 months duration) chronic (>4 months duration).⁷ The origin of neck pain is multifactorial.⁸ Neck pain may result from many causes (inflammatory conditions, infection or trauma, congenital diseases, and rheumatic disorders) but most often the condition is labeled as nonspecific neck pain because no specific cause is found.⁹ Etiological factors are poorly understood and it usually involves depression, poor posture neck strain, anxiety, and occupational injuries.⁴ It is observed that neck pain may be linked to mechanical restriction between two or more vertebrae which, cause a

range of motion reduction.¹⁰ Neck pain is the most common complaint with a limitation of mobility.¹¹ A subjective feeling of stiffness and limited range of motion may accompany neck pain, which is often aggravated or precipitated by sustained neck postures or neck movements.¹² A patient with neck pain mostly present with posture imbalance resulting from increased activation and shortening of the following group of muscles: sternocleidomastoid, upper trapezius, Levator scapulae, suboccipital, scalene.¹³ Most of the treatment regarding neck pain is based on clinical diagnosis done by clinical sign and symptoms, patient presentation and clinical examination.¹⁴ The classification of the patient is based on signs and symptoms identified during clinical examination and when it is used to categorize subgroups of patients that are homogenous with respect to the outcomes of particular intervention.¹⁵

There are different physical therapy interventions for the treatment of neck pain. Such as, mobilization and massage are used but no evidence is found for long-term effectiveness.¹⁶ Neck stretching and strengthening exercise have also improved neck function shown in addition to reducing pain.⁸ METS may be used to stretch tight muscles and fascia, decrease pain, reduce muscle tonus, mobilize joint restrictions, improve local circulation and strengthen weak musculature.¹⁷ Stretching is a physical exercise performed actively or passively, manually or mechanically to lengthen the shortened or hypo mobile structures to gain or maintain flexibility of the associated area.¹⁸ It involves to lengthened the muscle to maximum discomfort level and then hold it for a specific time of 30 seconds followed to return it to the normal length of the muscle.¹⁹ As many as earlier studies have combined passive and active therapies, insufficient evidence has been obtained thus far on the relative effectiveness of these types of therapies on neck pain.¹⁶ Some studies suggest stretching and manual therapy were effective in short term treatment for reducing both strain-evoked and spontaneous pain in patients with nonspecific neck pain.²⁰ Muscle energy technique is an established osteopathic manipulative intervention often used to treat somatic dysfunction of body.²¹

There exist clinical gap and lack of standard evidence about the effectiveness of stretching exercises in comparison with muscle energy technique in reducing

the pain and disability of non-specific neck pain. Therefore, this study is conducted to evaluate the effectiveness of the two treatments options available and to find out either which one treatment is a better option in a patient complaining non-specific neck pain.

Methodology

The 40 number of patients were included who had cervical region pain. Patients were randomly assigned in two groups. Types of treatment for subjects were according to medical moral values and it was harmless and beneficial for the patients. The improvement was noted and compared. A proper Consent was taken from each patient through permission form. Sparling's test²² and upper limb tension²³ test done to assess the neck pain. Both subjective and objective information was collected after a physical examination by the therapist. This information includes age, socioeconomic status, gender, educational status, and marital status, type of pain and total interval of the arrival of pain. Visual analog scale with 0 at one end representing "no pain" and 10 at other end representing "worst imaginable pain". The NPRS is a reliable and valid instrument to asses' pain. Subject completed the neck disability index to measure perceived disability. The NDI is scored from 0 to 50. The higher score corresponds to the greater disability. The score was multiplied by two and then expressed as a percentage.

NDI has been demonstrated to be a reliable and valid assessment of disability in patients with neck pain after that patient was randomly assigned to receive either stretching of neck muscles or muscle energy technique. Each participant requested to draw either number one or number two from a box. Number one was allocated to Group A and number two was allocated to group B. Each exercise was repeated 5 times twice a week for 4 weeks with interval of 05-second rest during one stretch to another.

Potential participants were patients between 15 and 55 years of age including both genders. Patient presented with non-specific neck pain. Patients with "red flag" for a serious spinal condition e.g., infection, tumors, spinal fracture, etc. were excluded. Also those patients having osteoporosis, pregnancy, and neurologic signs and symptoms suggestive nerve root involvement, history

of cervical surgery, exhibit hypermobility of the thoracic spine, migraine cervical headaches and Headaches as the consequences of a specific headache were excluded from the study. The SPSS (statistical package for social scientists) version 16 was used for data analysis.

Results

44 subjects completed the study and 4 subjects were dropped out as they could not complete the treatment sessions. The results showed that the patient included in both groups have to age between 18 and 60. There were 22 male patients and 22 female patients that were randomly selected. Paired sample t-test for NDI and NPRS shows significant ($P=0.001$) reduction in neck disability and pain in both groups. The comparison of values of active ROM for Pre-treatment and Post-treatment also revealed significant reduction ($P=0.001$) in both groups but the Pre-treatment and Post-treatment values of NDI, NPRS and AROM shows that Group B is clinically more superior than Group A in reducing pain and improving ROM of the neck.

Discussion

The study was conducted to compare the efficacy of muscle energy technique and static stretching in patients with cervical region pain. There was a significant decrease in patient's pain scores within the group analysis when pre and post intervention scores

were compared in both groups. Still, there was lot of improvement in MET group was noted as compared to static stretching. The pain was more reduced in MET group which can be explained under the mechanism of inhibition Golgi tendon reflex. This reflex initiates when affected muscle is contracted isometrically against resistance which in turn lead to reflexive relaxation of that muscle.²⁴ On isometric muscle contraction mechanoreceptors of joint cause sympathetic excitation which through somatic efferent and local peri-aqueduct gray matter plays its parts in pain reduction. The result obtained for pain in the MET group were in the consensus of previous studies in which pain intensity reduced following MET over neck area or other area.²⁵ According to research conducted by Richard, the pain get worse when MET is applied along with manipulation in few patient, so it can't be concluded whether this increase in pain was due to an application of MET or manipulation or both. Stretching cause inhibition of GTO which results in slow downing or damping of motor neuronal discharge which in turns induces relaxation of the musculotendinous unit by adjusting its length. This whole reflex is responsible for relaxation in the musculotendinous unit and therefore pain perception is reduced.²⁶ Group analysis revealed statistically significant improvement in cervical ROM. Both the MET and static stretching showed greater improvement. Combination of contraction and

Table No.1: Neck disability index, NPRS & range of motion among static stretching and muscle energy technique

Measure	Group	Pre-value	Post-value	Mean difference \bar{e} SD	P-Value
NDI	Static Stretching	44.55 \pm 11.362	16.05 \pm 6.901	28.565 \pm 10.359	0.001
	Muscle Energy Technique	40.15 \pm 12.741	8.55 \pm 6.708	31.600 \pm 13.620	
NPRS	Static Stretching	6.75 \pm .786	3.35 \pm .875	3.400 \pm .754	0.001
	Muscle Energy Technique	6.95 \pm .999	2.25 \pm .786	4.700 \pm 1.031	
Active Neck Flexion	Static Stretching	55.15 \pm 6.877	70.15 \pm 5.547	-15.000 \pm 5.448	0.001
	Muscle Energy Technique	52.95 \pm 11.628	74.753 \pm 3.959	-21.800 \pm 9.987	
Active Neck Extension	Static Stretching	26.20 \pm 6.986	32.10 \pm 4.930	-5.900 \pm 4.471	0.001
	Muscle Energy Technique	23.70 \pm 4.054	32.15 \pm 3.048	-8.450 \pm 5.414	
Active Neck Side bending	Static Stretching	29.15 \pm 6.784	39.55 \pm 6.770	-10.400 \pm 4.477	0.001
	Muscle Energy Technique	25.10 \pm 8.026	43.90 \pm 2.634	-18.800 \pm 7.647	
Active Neck Rotation	Static Stretching	44.50 \pm 5.296	65.50 \pm 7.924	-21.000 \pm 7.698	0.001
	Muscle Energy Technique	51.90 \pm 12.008	78.60 \pm 5.471	-26.700 \pm 11.815	

stretches might be more effective for producing viscoelastic change than passive stretching alone, because the greater forces could produce increased viscoelastic change and passive extensibility.²⁶ The effect of MET component for increase ROM post-intervention can be explained on the basis of physiological mechanisms behind the changes in muscle extensibility – reflex relaxation, viscoelastic change, and changes to stretch tolerance. The study shows the almost similar result as conducted in previous studies over neck area. There is an immediate increase in ROM of neck in all three planes after the application of MET. It produces a significant increase in cervical ROM in the treatment group. Passive manual stretch facilitates the laying down of collagen and regains of muscle length which decreases the muscle stiffness via passive viscoelastic changes or an indirect decrease because of reflex inhibition. The result of static stretching significantly improves ROM was consistent with the study conducted on the other areas of body. Significant improvement in ROM of shoulder²⁷, hip²⁸ and knee¹³ was found within the group when heat is followed by stretching.

The present study found no significant difference in improvement of cervical ROM between the MET and static stretching. The possible explanation of the increase in ROM in both group relies on the effect of autogenic inhibition.²⁹ Advice on correction of postural abnormalities is important in preventing the recurrence of pain. It has been seen that in nonspecific neck pain many muscles are found to get shortened. However, intervention is given to upper trapezius and levator scapulae. In my study, I have applied intervention on scalene, SCM, along with upper trapezius. Because these muscles also tend to get shorten and reduces cervical rotation and lateral bending.

Conclusion

Future researches with greater sample size are recommended. Future research is required to determine long-lasting effects of the treatment by taking follow up assessments for longer duration. Giving intervention to another group of muscles (of neck) which might give more beneficial results is recommended. It is concluded that both stretching and muscle energy technique can be used for the treatment of non-specific neck pain and stiffness but MET is found to be superior over simple stretching in

reducing pain and improving stiffness and range of motion at cervical spine.

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Comparing Fasting Homocysteine Levels Among Healthy Adults, Diabetic and Non-Diabetic Cardiac Patients

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Homocysteine, fasting, cardiac patients, diabetes, healthy adults.

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Introduction

Cardiovascular diseases (CVDs) are a group of disorders involving the heart and blood vessels or both. These are the number one killing disorders in both developed and developing countries.¹ Cardiac disease-related morbidity and mortality commonly caused by stroke, congestive cardiac failure, and ischemic heart disease. In developed countries, ischemic heart disease is the single largest cause of death so CVDs are considered as a significant burden. Smoking, hypertension, diabetes, lipid abnormalities, obesity, and

ABSTRACT

Objective: To Compare the level of fasting homocysteine among healthy adults, diabetic and non-diabetic cardiac patients.

Methods: Using Purposive sampling method, Comparative analytical study was conducted in Rawalpindi institute of cardiology between 6th June to 15th July 2016 and included healthy adults, diabetic cardiac and non-diabetic cardiac patients between ages of 20 to 60; blood were drawn during last week of Ramadan and then examined for homocysteine level. Additional information like age, ESR, lipid profile and Leukocytes count were also Analyzed.

Results: Of the 93 subjects, there were 30(32.3%) each in healthy adults and diabetic cardiac patient groups A and C respectively but 33(35.5%) patients were in non-diabetic cardiac patients group B. The mean age of group A, B and C were 51.3+5.6 years, 56.73+9.35 years and 52.4+9.07 years respectively. The mean values of homocysteine were 12.3, 14.39 and 15.17 among group A, B and C respectively. The mean values of LDL were 2.90, 3.58 and 3.35; for HDL 1.09, 1.19, and 1.19 among group A, B and C respectively. The mean values of Triglycerides were 1.45, 1.96 and 2.07; for Cholesterol 4.72, 5.71 and 5.52 among group A, B and C respectively.

Conclusions: We may conclude that fasting may have beneficial effects on maintaining homocysteine levels among healthy adults, diabetic non cardiac patients as their mean values were within normal range, as well as on diabetic cardiac patient but there value were near to normal.

sedentary lifestyle are the known risk factors for cardiovascular diseases. However, there are some emergent or new risk factors.²

Diabetes mellitus (DM) is a group of metabolic disorders in which blood glucose level increases because of abnormality in the secretion of insulin, its action, or both. Due to increased risk factors e.g. Population growth, aging, obesity, and physical inactivity the number of diabetic patients is increasing worldwide.³

An influential risk factor for heart diseases is Diabetes mellitus. There is two times increased risk of having first myocardial infarction (MI) in diabetic patients. In diabetic patients after an acute MI mortality rate is higher as compare to non-diabetic. It is evident from recent literature that there is a two time increase in mortality rate in patients with diabetes in last 5 years.⁴

Homocysteine is a non-essential amino acid containing sulfur.⁵ It is similar in structure to the amino acid cysteine only difference is an additional methylene (-CH₂-) group.^[6] It has no role in protein synthesis.² It cannot be obtained from food so obtained by demethylation of dietary methionine by methyltransferase enzyme. Methionine is obtained from dairy products, canned foods and white flour.⁵ By using vitamin B, homocysteine can be converted into cysteine or recycled into methionine.⁶

The presence of an abnormally elevated level of serum or plasma homocysteine is defined as Hyperhomocysteinaemia.² With a high "H Score," or increased serum homocysteine levels, there is a three times increased risk of heart attack as it converts the low density lipoprotein (LDL) into oxidized LDL. It encourages blood clot formation and platelets aggregation and multiply-part of the atherogenic process.⁵

Increased serum homocysteine level is implicated as an early promoter of atherosclerosis⁷ It is considered as a modifiable and independent risk factor for cardiovascular diseases.⁵ It is evident from literature that homocysteine levels are significantly higher in patients with CAD and diabetes mellitus particularly in type 2 diabetes.^{3, 7, 8}

Increased homocysteine levels also correlated significantly with increasing severity and complication of CAD⁵ In type 2 diabetic patients, increased plasma homocysteine level is related to macro vascular disease and death⁶ Studies suggested that elevated level of homocysteine accelerates the risk of cerebral /peripheral vascular disease and MI in both genders.⁹

During the blessed month of Ramadan (lunar month of the Muslim year), which is mandatory for all Muslims to refrain from drink, food and smoking every day from dawn to dusk. Numerous studies have documented the physiological effects of Ramadan, specifically regarding changes in lipids profile, blood pressure, fasting

blood sugar, hormonal and other biochemical markers. However, the association of homocysteine among the healthy, diabetic and non-diabetic cardiac patients and biochemical factor such as homocysteine, a significant relationship between atherosclerotic risk factors that have been previously documented but not yet been studied during the holy month of Ramadan. The purpose of the present study was to compare the level of fasting homocysteine among healthy adults, diabetic and non-diabetic cardiac patients.

Methodology

Purposive sampling technique was used, comparative analytical study was conducted in Rawalpindi institute of cardiology between 6 June to 15 July 2016 and comprised of healthy adults, diabetic cardiac and non-diabetic cardiac patients between age of 20 to 60 years and were fasting for the whole month, blood samples were drawn during last week of Ramadan and then examined for homocysteine level and lipid profile. Patients with any other comorbidity were excluded from the study. Samples containing ethylenediaminetetraacetic acid (EDTA), plasma and blood cells were then separated through centrifugation in machine. Plasma total homocysteine was measured with fluorescence detection. By using Technicon serum total cholesterol and triglycerides were measured. LDL-cholesterol concentrations were calculated by using the formula of Friedewald et al. Additional information like age, height, weight, BMI, ESR, and Leukocytes count were also analyzed. SPSS software version 21 was used for data entry and analysis and then data are reported in means \pm SDs. Statistical analysis of the results was then performed by using one way ANOVA with the mean values, standard deviation among healthy subjects, Non diabetic; cardiac Subjects and diabetic; cardiac Subjects. Significance value was set at $P < 0.05$ for all statistical tests.

Permission for the study was obtained from the head of the department cardiologist. Written informed consent was taken from all subjects at the time of blood.

Results

Out of total 93 individuals, there were 30(32.3%) each in healthy adults and diabetic cardiac patient groups A and C respectively but 33(35.5%) patients were in non-diabetic cardiac patients group B. The mean age of group

A, B and C were 51.3 ± 5.6 years, 56.73 ± 9.35 years and 52.4 ± 9.07 years respectively in three groups.

The mean values of homocysteine were compared among Healthy subjects, Non diabetic; Cardiac Subject and Diabetic; Cardiac Subject respectively. In which there is a significant difference between these groups with $P = 0.012^*$. P value of HCY between Group A & C is 0.016 there is a significant difference between this groups. P value of HCY between A & B and Group B & C are 0.09 and 0.721 respectively so there is no significant difference in these groups. (Figure No 1)

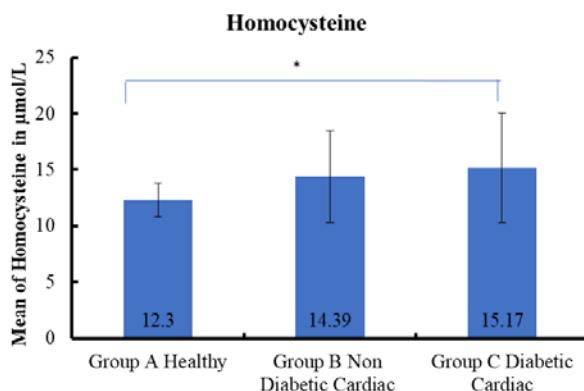


Figure 1 Shows the mean \pm SD of Homocysteine among the Groups

* means P value < 0.05 statistically significant.

Table I Shows comparison of the mean with standard deviation of different variables among Healthy

subjects, Non diabetic; Cardiac Subject and Diabetic; Cardiac Subject.

The mean values of LDL, triglycerides, cholesterol and HDL were also compared among Healthy subjects, Non diabetic; Cardiac Subject and Diabetic; Cardiac Subject respectively. In which there is a significant difference between these groups with $P < 0.001^{***}$ except HDL. (Table no I)

P value of LDL between Group B & C are 0.211 so there is no significant difference in this group. P value of LDL between Group A & C is < 0.05 and Group A & B is < 0.001 there is a significant difference between these groups. P value of Triglycerides between Group A& B and Group A & C are 0.005 and 0.001 there is significant difference between these groups. P value of Triglycerides between Group B & C is 0.761 there is no significant difference in this group. P value of Cholesterol between Group A& B and Group A & C are < 0.005 there is significant difference between these groups. P value of cholesterol between Group B & C is 0.516 there is no significant difference in this group.

Discussion

This comparative analytical study compared three groups (healthy adults, diabetic cardiac and Non-diabetic cardiac patients) for the effects of fasting on homocysteine levels and lipid profile (cholesterol, HDL, LDL and TGs). According to the results, fasting improved

Table No I: Show mean \pm SD of different variables among healthy subjects, non diabetic; cardiac subject and diabetic; cardiac subject.

Variable	Group A: Healthy subjects (Neither cardiac, nor diabetic) (n=30) Mean \pm SD	Group B: Non diabetic; Cardiac Subject (n=33) Mean \pm SD	Group C: Diabetic; Cardiac Subject: (n=30) Mean \pm SD	P-Value One-way Anova
TLC (Total leukocytes count in cells/ cumm)	9716.67 ± 792.67	9336.36 ± 2631.64	9686.67 ± 2835.82	0.763
ESR (mm/hr)	13.20 ± 1.54	24.39 ± 5.04	26.27 ± 6.90	$< 0.001^{***}$
Cholesterol (mmol/L)	4.72 ± 0.38	5.71 ± 0.79	5.52 ± 0.72	$< 0.001^{***}$
Triglycerides (mmol/L)	1.45 ± 0.49	1.96 ± 0.56	2.07 ± 0.73	$< 0.001^{***}$
HDL (mmol/L)	1.09 ± 0.28	1.19 ± 0.69	1.19 ± 0.43	0.085
LDL (mmol/L)	2.90 ± 0.26	3.58 ± 0.69	3.35 ± 0.44	$< 0.001^{***}$

* $p < 0.05$

*** $p < 0.001$

the homocysteine and lipid profile levels.

Our results are supported by previous researches such as a study conducted on Effects of Intermittent Fasting on Serum Lipid Levels, Coagulation Status and Plasma Homocysteine Levels and demonstrated that intermittent fasting has some positive effects on plasma homocysteine levels and serum HDL.¹⁰ Another study demonstrated that in a model like Ramadan prolonged intermittent fasting led to beneficial changes on the risk factors for cardiovascular diseases such as homocysteine (levels were significantly low during Ramadan in the fasting subjects of both genders) but it contradicted some results of the current study as no significant changes were observed in serum total cholesterol, triglycerides and LDL levels.¹¹

Another study reported that during Ramadan changed feeding behaviors beneficially affects plasma lipids (significant decrease in serum total cholesterol and serum triglyceride concentration) and lipoproteins.¹² Results of another study revealed significant reduction in high-density lipoprotein (HDL) cholesterol levels which supports our results but there was the contradiction that no significant changes in other lipids.¹³

Another study done on the weight changes and metabolic profile during Ramadan fasting and its results contradicted our results as LDL increased and HDL decreased significantly but there was no significant factor seen in total TG and cholesterol, negative correlation between primary TG level before and during Ramadan, i.e., subjects with more TG level had a lesser increase in TG level during Ramadan (Pearson correlation=-0.432, sig= 0.000, n=81)¹⁴ thus a change in feeding behaviours during fasting in Ramadan beneficially effected homocysteine and lipid profile levels in all three groups.

Conclusion

Discussion demonstrates that fasting led to some beneficial effects on homocysteine levels as well as on lipid profile. By omitting at least one meal particularly at fasting time body is active metabolically and low blood viscosity level at same time. We conclude that fasting

might have favorable effects on homocysteine levels for healthy adults, diabetic non cardiac patient as well as on diabetic cardiac patient as their mean values are within normal range or near to.

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Outcome of Physical Activity on Depression and Anxiety Disorder Among Adults

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ABSTRACT

Background: Two of the most concerned mental health problems in our society are depression and anxiety. Anxiety and depression can often occur together, it is therefore important to know the signs and symptoms associated with them.

Objective: To determine the role of physical activity and exercise in depression and anxiety disorders.

Methodology: It was a study in which data was collected from Psychiatry Department of Jinnah Hospital. Research data was recorded by using prescribed validated questionnaire, psychological measurement tool Beck Depression Inventory-II. Patients were divided in two groups. First group took medication only and the other was provided with medication and physical activity plan. A baseline measurement was taken and then a follow up after 4 weeks was done and the difference in the scores was noted down in both groups.

Results: The decrease in the scores of BDI-II was significantly higher in group who took medication with exercises as compared to group who were treated with medication only. The decrease of depression in group treated with medication and exercises significant at $P=0.019$ levels showing that exercises with medication is more effective than only medication. The percentage of patients with mild depression post treatment was 40% in physical activity group as compared to 52% in medication group while percentage of patients with no depression in physical activity group was 48% as compared to 18% in medication group which is significantly higher.

Conclusions: After the follow up of four weeks it was noted that the second group in which patients were treated with medication and physical activity was better relieved from depression signs and symptoms than the patients who were treated with medication only. So, physical activity that is organized and structured can be incorporated as an effective strategy for the treatment of depression.

Introduction

Anxiety and depression are the commonly seen problems of the youth. Majority of the researches are conducting now days on youth and depression and causes of depression in youngsters.¹ Anxiety and depression when combines together, globally their ranking is first, among the non-fatal diseases. Among the fatal diseases it ranked second and the first is coronary heart problems. While gathering evidences that if physical activity have positive effects on patients mental health and other systematic disease like heart diseases, it was noticed that majority of the Asians are not active at all.²

When it comes to physical activity, it is observed that minimum thirty mins walk or activity is necessary for the change of mental and physical health. It was also stated that this thirty minutes physical activity should be of moderate capacity. If it's not possible to work out on daily basis, most of days should be recommended. Physical activity in any way is appreciated.³

It was commonly seen that females are more prone to the depression and anxiety than males but it was seen that not only girls are victims of depression and anxiety but also the boys in the equal state.⁴ But when the

girls reach at the age of puberty, their depressive moods increase up to the two ratio one when it comes in comparison to the boys. It does not matter what age the person is, depression and anxiety can grab to anybody in any situation⁵ physical activity is an effective, low-cost and generally safe component of depression management. Health experts advise people with depression to try to increase physical activity for its physical and psychosocial benefits. Consider cardiovascular risk assessment in people with depression, given the evidence that depression, social isolation and a lack of quality social support are independent risk factors for heart disease.⁶

Many researchers showed that people that experience exercise daily depressed lesser than the people those don't take part in any sort of physical activity and exercise.⁷ Many randomized clinical trial showed that people should do at least moderate intensity exercise in order to get better prominent improvement. Researcher also mentioned that physical activity only and exercise both are different things and for combating with the anxiety or depression patient should experience exercise.⁸ They mentioned that sixteen weeks regular exercise is as effective as any anti-depressant drug. Trial showed that regular exercise for three weeks concluded to twenty percent decreased in risk of anxiety symptoms for 5 years.⁹

Methodology

Study design was Quasi Experimental study. Data was collected from outpatients department of Psychiatry ward at Jinnah Hospital Lahore. The study was completed in duration of 3 months between October 2015 and December 2015. Non probability convenient sampling was used. Using a 15% prevalence of depression in adult population with 95% confidence level and 7% margin of error.

Studies were calculated for estimating the infinite population proportion. Inclusion Criteria was age group between 20-50 years preferably, both genders and Patients with mild to moderate and severe depression and anxiety disorders. Exclusion Criteria was Epileptic patients and Patients with cardiovascular disease. Data was collected with the help of psychological measurement tool Beck Depression Inventory-II. It was a self-report

instrument for measuring the severity of depression in adults and adolescents aged 13 years and older. The BDI-II is scored by summing the ratings for 21 items. Each item is rated on a 4-point scale ranging from 0-3. The maximum total score is 63.

Patients were divided in two groups. First group took medication only and the second group was provided with the medication and physical activity. Patients were assessed initially and scores were noted. The patients in second group were given an exercise plan of 30-40 minutes preferably aerobics in the form of running or brisk walk six days a week in addition to medicines. A follow up assessment was made at 4 weeks interval and changes in scoring were noted down for both the groups. The data was analyzed by using the SPSS 20.0 statistical software. The chi square test was used for comparing the two groups. The statistical significance was set at 5% level. Results were recorded at last day of the last week.

Results

As table shows that there were 35 males in medication group and 15 females in the medication group. There were 9 males in the exercise medication group and 41 females in exercise medication group. There were 12 patients of moderate depression in the medication group and 38 patients of severe depression in the medication group before treatment. There were 27 patients of moderate depression in the exercise medication group and 23 patients of severe depression in the exercise medication group before treatment.

The number of patients of No depression is 9 in the medication group after treatment, 26 patients of mild depression and 15 patients of moderate depression in the medication group after treatment.

Table I: Frequency/Percentage of males and females in group I and II

Study group	Gender	Frequency	Percentage
Medication only	Male	35	70%
	Female	15	30%
Exercise and medication	Male	9	18%
	Female	41	82%

Table II: Beck Depression Inventory-II before Exercises			
Study group	Variables	Frequency	Percentage
Medication Only Pre Treatment	No depression	00	00%
	Moderate depression	12	24%
	Severe depression	38	76%
Exercise and Medication Pre Treatment	No depression	00	00%
	Moderate depression	27	54%
	Severe depression	23	46%

Table III: Beck Depression Inventory-II after Exercises			
Study Group	Variables	Frequency	Percentage
Medication Only	No depression	9	18%
	Mild depression	26	52%
	Moderate depression	15	30%
Exercise and Medication	No depression	24	48%
	Mild depression	20	40%
	Moderate depression	06	12%

The number of males affected by severe depression before treatment was 32 and female patients were 29 before any treatment. Number of male patients with moderate depression is 12 and females are 27 before any treatment. So according to this data the male patients were more prone to severe depression than females.

Table IV: Gender both groups combined: beck depression inventory-II before exercises				
Count	Beck Depression Inventory-II Before Exercises			Total
		Moderate Depression	Severe Depression	
Gender	Male	12	32	44
	Female	27	29	56
Total		39	61	100

Chi-Square Tests

a. 0 cells (.0%) have expected count less than 5.

The minimum expected count is 17.16.

b. Computed only for a 2x2 table

Table V: Gender Both Groups Combined: Beck Depression Inventory-II after Exercises				
Count	Beck Depression Inventory-II after exercises			Total
	No Depression	Mild Depression	Moderate Depression	
Gender	Male	9	23	12
	Female	24	23	9
Total		33	46	21
100				

Gender Both Groups Combined: Beck Depression Inventory-II before and after Exercises.

It can be seen very easily that after the treatment session number of male patients with no depression is 9 and females is 24 which means male patients responded less to the treatment given as compared to the female patients.

Discussion

The effectiveness of physical activity as compared to medications only in the patients of depression and anxiety was assessed. Effectiveness was checked by difference in scores of a standard scale, Beck Depression Inventory-II before and after treatment. Patients were divided into two groups one with medication only and the second was given an exercise plan with medication. It was seen that the patients treated with exercises and medication responded better as their scores for depression decreased much more than the patients treated with medication only.

The percentage of patients with mild depression post treatment was 40% in physical activity group as compared to 52% in medication group while percentage of patients with no depression in physical activity group was 48% as compared to 18% in medication group which is significantly higher. Among patients in medication and exercises group, the number of male patients with no depression was 9 and females was 24 which means female patients responded better to the exercise as compared to males. And further the males were found to be more affected by severe depression

According to Cai S et al., 2000 decrease in the scores of BDI-II was significantly higher in group who took medication with exercises as compared to group who were treated with medication only. The decrease of depression in group treated with medication and exercises significant at $P=0.019$ level showing that exercises with medication is more effective than only medication. It was also noted in our study.¹

According to (Brown CS et al., 2001), depression and anxiety is very much common in the married individuals than unmarried individuals. Exercise also has beneficial effects on panic disorders related to anxiety, and these effects are comparable to medication and relaxation procedures. Regular exercise within a certain limit appears to benefit in the married people. In our study it was noted that number of married patients with severe depression was 32 and unmarried were 29. Unmarried patients with moderate depression were 15 and married were 32 before any treatment. It means married patients are more prone to the severe depression.²

According to Carek PJ 2011 , a research studied the effect of exercise on 32 women with depressive symptoms (physician diagnosed and confirmed with the Beck Depression Inventory) residing in the greater Boston area in a month intervention study.³ Women were randomly assigned to either a clinic-based or home-based exercise intervention, with assessments at baseline and 3-months. At the end of treatment, of the total sample, 46.9% of participants experienced a 50% reduction in depressive symptoms. It was noted in our study that females got more benefits from exercises by showing a more reduction in scores.⁹

Conclusion

After the follow up of four weeks it was noted that the second group in which patients were treated with medication and physical activity was better relieved from depression signs and symptoms than the patients who were treated with medication only. So physical activity that is organized and structured can be incorporated as an effective strategy for the treatment of depression

Recommendations

The current study was conducted in a limited place using non probability convenience sampling. But it may be more representative, if done on a large scale and along with questionnaire a qualitative interview of the respondents

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Frequency of Cardiovascular Risk Factors among the Athletes and Non-Athletes

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ABSTRACT

Background: Proper screening of the cardiovascular risk factors is not a common practice in Pakistan until the development of signs and symptoms, which is a concerning factor regarding the cardiovascular implications on athletes and other individuals.

Objective: To determine the frequency of cardiovascular risk factors among athletes and non-athletes.

Materials and Methods: A cross sectional study was conducted on 417 individuals (n=189 athletes and n=228 non-athletes), aged 15-30 years, recruited from fitness centres of twin cities (Rawalpindi-Islamabad), over a duration of 6 months (January 2016 to June 2016). The sample was selected on the basis of inclusion criteria and non.-probability convenient sampling was employed. A self-structured questionnaire was filled by all the participants to assess the presence of cardiovascular risk factors.

Result: Out of a sample of 417 individuals, 189 were athletes and 228 were non-athletes with a mean age of 23.7 ± 3.22 . The frequency of the risk factor hypertension was found to be higher in non-athletes (5.8%) as compared to athletes (0.7%). Smoking was equally present in both athletes 32 (7.7%) and non-athletes 40 (9.6%). Hypertension and cholesterol which showed significant difference with p value < 0.001 . Obesity and psychological risk factors depicted low significant difference with the p value < 0.05 i.e. (0.023 and 0.027) respectively, whereas the other risk factors smoking and diabetes showed no significant difference.

Conclusion: It was found that the proportion of individuals to have cardiovascular risk factors was higher in the non-athletes as compared to athletes. Also hypertension, cholesterol, obesity and psychological risk factors were significantly associated with non-athletes.

Introduction

Physical activity is a movement of the body which utilizes energy and produced by skeletal muscles.¹ It is reported in literature that females with sedentary lifestyle who adopted a physically active lifestyle between a baseline and a follow-up visit after 6 years had 32% and 38% decreased cardiovascular mortality rates, when compared with females who presented with sedentary lifestyles at both visits.² Of particular concern are the cardiovascular risk factors which are affected by the level of physical activity. A large cohort study was conducted on males enrolled in the follow-up Study of Health Professionals. The independent effects of types, intensity

and volume of exercise on the possibility of developing coronary heart disease (CHD) were observed.³ Women's Health Study demonstrated that, an intensity of exercises like walking pace and walking duration had inverse and independent relation with the coronary events risk.⁴

Major risk factor for developing coronary artery disease is physical inactivity. Exercise capacity can be improved by regular aerobic training which has vital role in preventing primary and secondary cardiovascular pathologies.⁵ Physical activity also plays an important role to control, diabetes, dyslipidaemias and obesity.⁶

Literature suggested that thorough intrusion like smoking control, normalization of blood lipid, weight reduction, and routine exercise can markedly reduce the severity of atherosclerosis and rate of progression of coronary artery disease.⁷ There has been considerable engrossment in the impact of vigorous training on the cardiovascular system of athletes about 100 years.⁸ Electronic media reported multiple events of sudden cardiac deaths of trained athletes related to exercise training over last few years, causing a considerable impact on both the physician and community.⁹

Chronic hypertension is one of the most commonly occurring risk factors of CVD and is one of the most frequent risk factor exists among people developing cardiovascular problems.¹⁰ Lifestyle modification in a healthy way like weight reduction and increased physical activity, contribute significantly to control blood pressure.¹¹ Exercise and routine Physical activity reduce the risk of mortality in diabetic patients. According to the Harvard Alumni Study, the development of type 2 diabetes and free time exercise were inversely related among men.¹² The Diabetes Prevention Program Research Group Study on the comparison of metformin with lifestyle modifications and exercise provided strong evidence that lifestyle changes were more potent in decreasing the incidence of diabetes. The occurrence of diabetes mellitus was 11% and 23% in the intervention and control group respectively after a follow-up of 3.2 years. Among the intervention group, there was 58% reduction in the overall possibility of diabetes mellitus.¹³

In both the normo-lipidemic and dyslipidaemic persons, properly prescribed aerobic exercise results in favourable changes in serum lipids and lipoproteins.¹⁴ In people with low-fat diets, moderate to high level aerobic activities can reduce the HDL cholesterol levels in the blood.¹⁵ Obesity is a multifactorial factor which not only directly increases the risk of CHD but also causes unfavourable effects on other risk factors, like peripheral insulin resistance and hypertension and boosts it indirectly. Although the causes of obesity are multiple, but the most important factor is physical inactivity. According to literature, in American adults, the risk of developing diabetes among physically active individuals (≥ 5 bouts of physical activity/week in free time) was 50% lower compared to physically inactive adults.¹⁶

In addition to the aforementioned risks, smoking is another risk factor which plays a crucial role in the development of CVD. A recent systematic review found that smoking termination in persons with known coronary heart disease was linked with a 30% lower primitive risk rate of death and myocardial infarction during the following 3 to 7 years.¹⁷ These can be present both in athletes, living a healthy lifestyle as well as in non-athletes as most of them adopt a sedentary lifestyle.¹⁸ This study was intended to determine the cardiovascular risk factors in athletes and non-athletes, hence it would be significant in highlighting the issue among the individuals who are more prone to develop CVD, as well as in facilitating them regarding lifestyle modification for better survival. The chief objective of this study was to determine the frequency of cardiovascular risk factors among athletes and non-athletes of twin cities (Rawalpindi-Islamabad).

Methodology

A cross sectional observational study was conducted on 417 individuals (including athletes and non-athletes) in various gyms of Twin Cities (Rawalpindi-Islamabad) (Smarts Gym Safa Gold Mall, Fitness centre G-7 Markaz Islamabad, Dar Gym, Bright figure gym and Pakistan Sports Complex Islamabad) over a time frame of 6 months (from January 2016- June 2016). The sample was selected on the basis of inclusion/ exclusion criteria. Both genders male/female with age 15 to 30 were included and individuals with any musculoskeletal or neurological disorders were excluded from the study. Non-probability convenient sampling technique was used for the sampling of data. A semi-structured questionnaire was designed under the supervisor's guidance, keeping in view the variables and objectives of the study. The online version of this form was spread among numerous International field Hockey players too. Additional questionnaire part; screening tool Physical Activity Readiness Questionnaire (PAR-Q) was also applied to assess the potential health risk status.¹⁹ Ethical approval was obtained from the gyms and fitness centres and informed consent was also obtained from all individuals involved in the study. The data collected was then analysed on SPSS 20. Basic frequency tables and cross tabulations were formed and chi square test of association was applied to find out the significant value.

Results

A total number of participants of the study was 417, out of which there were 189 (45.3%) athletes and 228 (54.7%) non-athletes. Mean age of the participants was 23.7 ± 3.22 years. Descriptive analysis showing the frequency of gender-wise distribution among athletes and non-athletes (Figure 1)

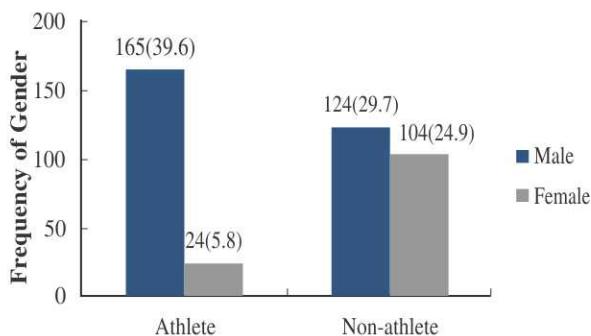


Figure 1. Shows the Frequency of male and female athletes and non-athletes

Chi square test of association was applied between the athletes and the non-athletes with different cardiovascular risk factors (Table no I)

Table I: Shows the frequency of cardiovascular risk factors among the athletes and non

Cardio Vascular Risk Factors	Athlete Frequency (%)	Non Athlete Frequency (%)	P- value
Hypertension	3(0.7 %)	24 (5.8%)	0.000***
Non Hypertensive	186 (44.6%)	204 (48.8%)	
Smoker	32 (7.7%)	40 (9.6%)	0.869
Non-smokers	157 (37.6%)	188 (45.1%)	
Obesity	4 (1.0%)	0 (0.0%)	0.027*
Non- Obesity	185 (44.4%)	228 (54.7%)	
Psychological	1 (0.2%)	9 (2.2%)	0.023*
Non-Psychological	188 (45.1%)	219 (52.5%)	
Diabetic	0 (0.0 %)	0 (0.0 %)	-
Non Diabetic	189 (45.3%)	228 (54.7%)	
High Cholesterol	0 (0.0 %)	0 (0.0 %)	
Never check	24 (5.8%)	69 (16.5%)	0.000***
Did Check Cholesterol but don't know	165 (39.6%)	159 (38.1 %)	

* $p < 0.05$

*** $p < 0.001$

According to the PAR-Q score, majority of the athletes and non-athletes had no probable health risk

associated with exercise. Among the non-athletes, 2.6% individuals scored >3 on the screening tool, which showed that they were at increased risk, as compared to the athletes in whom only 0.5% individuals were at risk. (Figure 2)

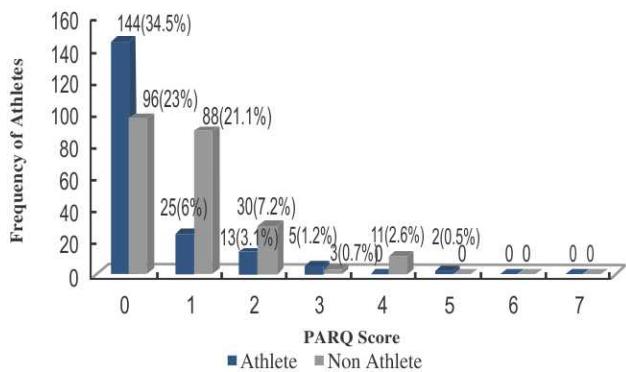


Figure 2. Shows the Frequency/percentage of PAR-Q Score among athletes and non-athletes

Discussion

This cross-sectional survey based study compared two groups (athletes and non-athletes) for the presence or absence of cardiovascular risk factors. According to the results, non-athletes showed more risk factors of cardiovascular diseases than the athletes.

The given results are supported by many previous researches such as a study conducted on global burden of cardiovascular diseases found that increase in CVD is related to the presence of hypertension, smoking and diabetes in people of South Asia.²⁰ Another study showed that the National Football League (NFL) players had a lower prevalence of reported smoking and dyslipidaemia, and a higher prevalence of hypertension which supports the current study in aspect of smoking and dyslipidaemia that was low among the athletes as compared to non-athletes but contraindicate with hypertension prevalence which was low among athletes in our study.²¹ As exercise produces various beneficial effects on cardiac function, atherosclerotic risk factors, size of a coronary artery, vascular tone and vasodilating ability, hence counteracts the negative effects of other factors, leading to fewer cardiovascular risk factors in the athletes.²² This stands true particularly for hypertension as in our study, majority of the hypertensives were non-

athletes, thus the odds of hypertension are reduced in physically active individuals.

Other study reports have concluded that there was a trend towards obesity (56%) among the players in the National Football League (NFL), whereas the current study contradicts these results as in our study, very less proportion (1.0%) of the athletes were lying in obese risk factor category.²³ This is because of the acknowledged fact that in addition to diet, regular exercise and physically active lifestyle is the most important adjunct in weight reduction and maintenance.²⁴

Another study done on Retired National Football League Players (non-athletes) found a high prevalence of obesity and significantly lower prevalence of diabetes, hypertension, and hyperlipidaemia. The current study findings regarding obesity are in accordance with these results as obesity was seen in higher frequency among non-athletes, whereas the results contradict regarding the other risk factors with a higher frequency of diabetes, hypertension, and hyperlipidaemia seen among the non-athletes in our study.²⁵ Physical activity is associated with a reduction in glucose intolerance, insulin resistance and hepatic glucose output,²⁶ thus a lack of physical activity as in the non-athletes in our study might have led to the development of diabetes and hyperlipidaemia.

Conclusion

This study was conducted that showed significant differences as cardiovascular risk factors were significantly higher frequent in non-athletes as compared to athletes, hence emphasizing upon the importance of regular physical activity and exercise in the non-athletes in order to prevent the development of cardiovascular disease risk factors. It was recommended to further evaluate each cardiovascular risk factor in a quantitative manner to present the data more statistically.

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Relationship Between Social Networking and Physical Activity of DPT Students of Riphah College of Rehabilitation Sciences Rawalpindi

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Introduction

Over the past few years there has been increasing interest of new generation of social media specially the use of social networking sites. This technology has its own negative sides as many experts have linked social networking with decline in physical activity.¹ Many New studies have shown that time spend on social networking expanges many useful activities including physical activity.² Physical activity is any bodily movement of skeletal muscles which results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be

ABSTRACT

Background: This study investigates how physical active students are and what is the effect of social networking on their physical activity.

Objective: To find relationship between social networking and physical activity of DPT students.

Methodology: A descriptive cross-sectional study was done in Riphah College of rehabilitation sciences. The study duration was completed from 1st June 2013 to 1st January 2014. Data was collected through semi structured questionnaire comprising of 5 demographic questions, rapid assessment of physical activity scale and 19 questions of social networking was used to collect data. Data was analyzed by SPSS 20.

Results: Total 95% students are using social networking sites, among them 38% students are physically active, 48% are physically under-active and 14% are physically sedentary. Majority of the students (80%) are spending approximately 1-4hrs on social networking sites and majority (49%) among them are incline toward under-active lifestyle.

Conclusion: The study shows that most of the students who are using social networking sites are physically under-active and students who are spending more time on social networking sites are less involve in physical activities.

categorized into occupational, sports, conditioning, household, or other activities. Physical activity is the best predictor of health status.³ Regular physical activity is recommended for health maintenance in adolescence, but basic descriptive epidemiological data are lacking for this age group.⁴ A social networking site is an online place where a user can create a profile and build a personal network that connects him or her to other users. When people join social networking sites, they begin by creating a profile, then make connections to existing friends as well as those they meet through the site. Social

networking sites (e.g., My Space and Face book) are popular online communication forms among adolescents and emerging adults.⁵ Face book is the most popular social networking site, with 93.4 per cent of students using it.⁶ In university of Ulster an online survey of around 350 students have done measuring social networking activity and levels of physical activity. The results showed that the immense majority of students used social networking sites like Face book and Twitter spend an average of one hour a day online. In the

physical activity questionnaire, just over half the students were classified as; 'moderately active' and a third were 'high activity', with a minority (12.7 per cent) falling into the 'low physical activity' group. A quarter of the respondents said they took part in team sports.⁷ No study has been done on this contrast in Pakistan. Although the study was undertaken to investigate the positive and negative effects of excessive Internet use on undergraduate students the sample consisted of 200 undergraduate students studying at the GC University Lahore, Pakistan. A set of Pearson Product Moment correlations showed positive associations between time spent on the Internet and various dimensions of the IES indicating that excessive Internet use can lead to a host of problems of educational, physical, psychological and interpersonal nature.⁸ Having in mind the previous researches, we considered of scientific importance to investigate the relationship of social networking and physical activity in students.

Methodology

Descriptive cross sectional study was conducted in Riphah College of Rehabilitation Sciences

with sample size of 300 students and Non probability purposive sampling technique were used. An inclusion criterion was DPT students of Riphah College of Rehabilitation sciences. Students other than DPT program were excluded. Data was collected on the basis of inclusion and exclusion criteria from the DPT students in 6 months. Data was analyzed on SPSS-20. For this purpose a semi structured questionnaire designed based on 5 demographic questions, rapid assessment of physical activity scale and 19 questions of social networking. The data was collected from 2nd to 10th semester of DPT. A total of 300 questionnaires were filled.

Results

Out of 300 students, 33 students (11%) are of age group 17-19 years, 213 students (71%) are of age group 20-22 years and 54 students (18 %) are of age group 23-25 years. The result shows that the sample has 258 (86%) female and 43 (14%) male. The Mean age was 21 ± 2.03 year.

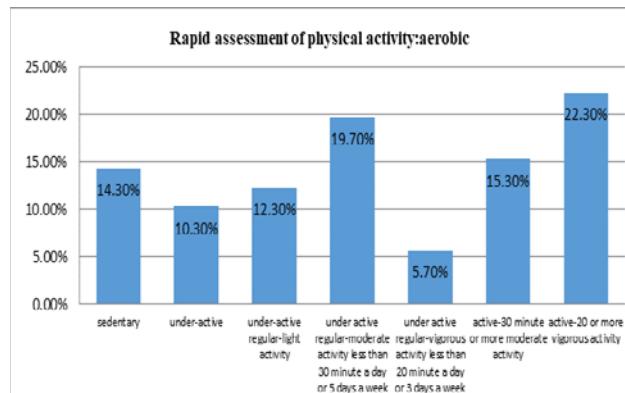


Figure no 1. Chart showing Rapid assessment of physical activity (aerobic)

Table no I: Rapid assessment of physical activity: aerobic * do you use social networking sites Cross-tabulation.

Rapid assessment of physical activity: Aerobic	Not use social networking sites	Use social networking sites	Total
Sedentary	2	41	43
under-active	0	31	31
under-active regular- light activity	5	32	37
underactive regular- moderate activity less than 30 minute a day or 5 days a week	4	55	59
underactive regular- vigorous activity less than 20 minute a day or 3 days a week	1	16	17
active- 30 minute or more moderate activity	2	44	46
active- 20 minute or more vigorous activity	1	66	67
Total	15	285	300

Table no II: Rapid assessment of physical activity: aerobic * Please state your average hours of social networking sites use per day Cross-tabulation.

Rapid assessment of physical activity: aerobic	1-4 hrs	5-8 hrs	9-12 hrs	13 hrs	Total
sedentary	34	4	2	1	41
under-active	26	2	2	1	31
under-active regular-light activity	28	5	0	0	33
underactive regular- moderate activity less than 30 minute a day or 5 days a week	47	6	1	1	55
underactive regular- vigorous activity less than 20 minute a day or 3 days a week	12	5	0	0	17
active- 30 minute or more moderate activity	34	7	3	2	46
active- 20 minute or more vigorous activity	51	13	1	1	66
Total	232	42	9	6	289

Discussion

The current study examined the relationship of social networking with physical activity of students. The study reported effect of effect of social networking on DPT student's physical activity. Sample size chosen for this study was 300. Data analysis and result shows that social networking has inverse relation with physical activity. There are several ways to check physical activity. Many tools and questioners have been designed but most authentic is RAPA (Rapid assessment of physical activity). It is thought to be valid, reliable and feasible mean of detecting physical activity level of person.⁹ This is already evident that use of social networking sites in increasing day by day. About one in seven people around the globe use a social networking site at least once a month and that number is expected to see grow significantly over the next several years.¹⁰ Technical advances have their down sides. Many studies have been conducted to link television, games and now social networking with a decline in physical activity.

Many studies have been conducted to relate social networking with physical activity both on national and international level. Majority of students used social networking sites like Face book and Twitter spend an average of one hour a day online. In the physical activity questionnaire, just over half the students were classified as; 'moderately active' and a third were 'high activity', with a minority (12.7 per cent) falling into the 'low physical activity' group. A quarter of the respondents said they took part in team sports.⁷ Researchers also found that most of the social networkers spent one hour a day

online, and that the most active social media users were also the least likely to play sports.¹¹ The current study shows that most of the students who are using social networking sites are physically under-active. This suggests that students who use excessive social networking sites have negative effect on their physical activity level. The possible explanation for this is time spent on the social networking site comes out as an expense for other activities. High time spend on online social networking would naturally lead to less time for outdoor or indoor physical activity. A study was conducted on evaluating the relationship between physical education, sport and social inclusion by Richard bailey in 2005 suggest that there is a positive relationship with participation in these activities (such as physical and mental health).however this study shows that most of the students who are using social networking sites are physically under-active and students who are spending more time on social networking sites are less involve in physical activities.¹²

Limitation:

One of the main limitations of our study was a relatively small sample. Although it was large enough for valid statistical analysis and representative enough for the conclusions about the study population in question, still, it would be interesting to see the results of a similar investigation designed to reflect the adolescent population of the entire country, or even region.

Conclusion

The study shows that most of the students who are using social networking sites are physically under-

active and students who are spending more time on social networking sites are less involve in physical activities.

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Frequency of Shoulder Pain Among Weight Lifters in Islamabad and Rawalpindi

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ABSTRACT

Background: Shoulder pain is a very common complaint in population because of shoulder joint's extreme mobility and less stability. Improper exercises or weight lifting not under the supervision of professional trainers or coaches may worsen or add to the development of glenohumeral joint hyper laxity, instability, or impingement.

Objective: To determine the frequency of shoulder pain among weight lifters in Islamabad and Rawalpindi.

Methodology: A descriptive cross sectional study was done in several different gyms of Rawalpindi and Islamabad from February 2015 to July 2015. A sample of 291 male weight lifters (age 14-55 years) was recruited through convenient sampling. Frequency of shoulder pain was assessed through self-structured Questioner. Data was analyzed through SPSS 21.

Results: The results showed that the mean age of the weight lifters was 24 and out of 291(100%) weight lifters 23% weight lifters had shoulder pain, among which majority had mild (46.3%) to moderate level (49.3%) pain. And mean of the DASH score was 40.96, indicates that shoulder Pain among weight lifters was causing mild disability.

Conclusion: It is concluded that a valuable percentage of weight lifters have mild to moderate level of dull shoulder pain. Among which majority has unilateral pain and this pain is more evident in those weight lifters who spend one hour daily in gyms and fitness centers for their workouts and do repetitive activities and work in overhead positions in there occupational settings or in their daily livings.

Introduction

Shoulder complaints are regular; population based studies have reported point prevalence going from 70 to 260 for every 1000.¹ The prevalence calculated of about 12 months in different studies ranges from 7 and 52%. The point prevalence to be calculated in The Netherlands has been evaluated at 21%. In a British study a lower point prevalence of 14% has been discovered.² Eighteen studies on prevalence and one study on incidence reports, incidence figures of 0.9–2.5% for different age groups. Prevalence figures differed from 7.2 to 28% for point prevalence, 19–33% for 35 days prevalence, 5.1–47.2% for 1 year prevalence and 7.2–67% for 1 year prevalence.³

Weight lifting is a famous physical act which is involved to gain proper fitness and is also involved for training activities like sports. "Weight lifting" is a generic term that is applicable to many power training activities, sports including power raising and muscle mass building. Bodybuilders involve themselves in maintaining good health and strength to enter in competitions for events.⁴

Power lifting is considered as a sport in which participants try to achieve a high percentage of their 1 repetition maximum in the progression of lifts including the deadlift, squat, and bench press. Current International Power lifting Federation (IPF) statistics show that bench press surpass the lifter's body mass by three times, squat

surpass the lifter's body mass by five times, and deadlifts also surpass the lifter's body mass by five times. These amazingly high loads may put the lifter at danger for a host of injuries. Power lifting has been connected with more than 1 injury for every year or 2.6-4 injuries for each 1,000 hours of training. Not surprisingly, the most frequently injured body part in power lifters is the shoulder. Raske and Norlin found that 93% of shoulder injuries in power lifters endured all the more than one month, recommending these wounds usually bring about delayed periods far from game.¹ Three anatomical regions thought to be at high danger of harm for weightlifting are likewise basic injury sites in numerous games the knee, the low back, and the shoulder. Information on power lifting and body building show that most injuries happen in the shoulder region, trailed by the low back and the knee. Athletic injuries to the shoulder most commonly involve the rotator cuff, glenohumeral joint, and acromioclavicular joint. Although less common, peripheral nerve injuries about the shoulder during athletic competition have increased along with the general interest in recreational athletics. Poor training techniques and specialization at an early age have contributed greatly to the increase in these injuries. Injuries to the maxillary, suprascapular, musculocutaneous, long thoracic, and spinal accessory nerves produce distinct clinical syndromes about the shoulder. Early recognition of these injuries by involved medical personnel is critical for the prompt treatment, rehabilitation, and return to sport in these athletes.⁵

Imbalance of the muscles responsible for scapula stability may develop from prolonged motor patterns "learned" through strength training activities, sport activity, injury, or simply from repetitive overuse of the shoulder joint.² Numerous competitors, who lift overwhelming weights, will naturally accentuate on change of pectorals, deltoid, and abdominal muscles quality, yet they neglect to enhance the quality of balancing out muscles of glenohumeral joint. In past studies, a general loss of shoulder rotation of weight lifters as compared with non-weightlifters and failure in shoulder adduction and internal rotation in weight lifters were observed.⁽⁸⁾ Injuries to the shoulder are generally regular among weight coaches and can be profession debilitating to those at the focused level. Luckily, most shoulder

Injuries from resistance training are minor musculotendonous strains or ligamento-scapsular sprains. Nonetheless, when improper exercises or exercise techniques are used, resistance training may worsen or add to the development of glenohumeral joint hyper laxity, instability, or impingement.³

Meth odology

A descriptive cross sectional study was done in several different gyms and fitness centers of Rawalpindi and Islamabad. The duration of our study was 6 months (from February 2015 to July 2015). A sample of 291 male weight lifters (age 14-55year) was recruited through convenient sampling. 36 subjects reported recent shoulder pathology, traumatic injury or fracture of shoulder complex region and thus excluded from the study on the basis of exclusion/inclusion criteria. Prevalence of shoulder pain was assessed by self-structured Questioner in which Pain assessment was done by NPRS, physical function and symptoms were measured by a standard DASH Questioner. Later the data was analyzed through SPSS.

Results

Out of 291(100%) weight lifters 23% weight lifters had shoulder pain that were at an average age of 24. Majority (59.1%) of the weight lifters visit the gym daily and (64.6%) weight lifters spent one hour, among which majority (46.3%) and (49.3%) had mild and moderate level of pain respectively. Result also showed that weight lifters with shoulder pain had more (82%) unilateral pain than (17.9%) bilateral pain.

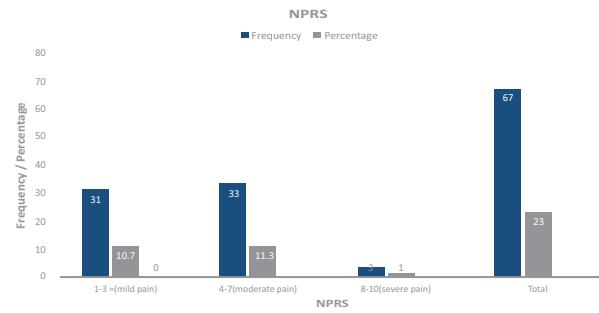


Figure 01: Intensity of Pain

Mean of the DASH score was 40.96, indicated that shoulder pain among weight lifters was causing mild disability. Out of (23%) weight lifters with shoulder pain majority (37.3%) weight lifters have dull pain, (45.7%)

weight lifters have no other joint pain, in majority (29.9%) weight lifters pain was aggravated by lifting arms and in (25.4%) weight lifters pain was aggravating by moving shoulder in different activities.

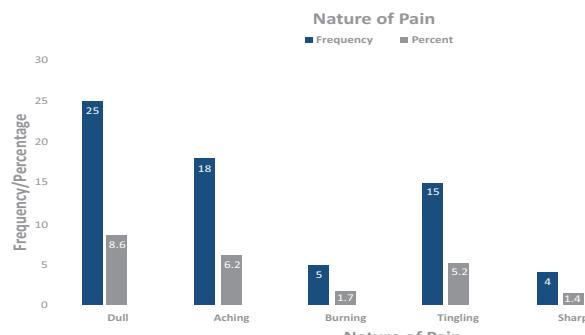


Figure 02: Nature of pain

Results also showed that majority of the weight lifters (67.2%) who had pain, performed repetitive activities in their occupational settings or in ADLs and (32.8%) weight lifters did not perform repetitive activities. And (53.7%) weight lifters worked in overhead positions and (46.3%) weight lifters did not work in overhead positions.

Majority (59.1%) of the weight lifters visits the gym daily and (64.6%) weight lifters spent one hour.

Discussion

Results of our study showed that 23% of weight lifters have mild to moderate level of pain. Majority of them were visiting the gym daily, performing repetitive movements in their occupational settings and their pain was aggravating by lifting arm over the head. And this pain was causing mild disability in performing their ADLs.

A study of Durall CJ, Manske RC and Davies GJ. In 2001 shows that weight lifters, coaches and trainers are at high risk of shoulder problems. They recommended that trainers should design exercise protocols according to every single participant's need so that improper and non-requiring exercises should be avoided. Trainers should prescribe muscle focusing, limited exercises so that every weakend muscle can be strengthened and repetitive use of any activity can be avoided.⁹

Poor training techniques and specialization at an early age have contributed greatly to the increase in shoulder pain. Injuries to the involving these structures called axillary, suprascapular, musculocutaneous, long

thoracic, and spinal accessory nerves causes mark able syndromes at shoulder complex. Also, when improper exercises or exercise techniques are used, resistance training may worsen or add to the development of glenohumeral joint hyper laxity, instability, or impingement.⁵

A recent study recommended that overuse stress injury of the proximal humeral physics is important to recognize early in order to prevent later complications. In adolescent athletes, glenohumeral instability is an important underlying pathomechanical basis for shoulder pain.¹⁰

In relation to our study a by Duralde, Xavier A reported that rotator cuff, glenohumeral and acromioclavicular joint injuries are very common in athletes. Moreover 1st degree nerve injuries also contributes in shoulder related pain and there recovery require an extended period of time.¹¹

Conclusion

Hence it is concluded that a valuable percentage of weight lifters have mild to moderate level of dull shoulder pain. Among which majority has unilateral pain and this pain is more evident in those weight lifters who spend one hour daily in gyms and fitness centers for their workouts and do repetitive activities and work in overhead positions in there occupational settings or in their daily livings. This pain was causing mild disability in their normal functioning.

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Effect of Action Observation Therapy In Spastic Kinds of Cerebral Palsy

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ABSTRACT

Background: Cerebral palsy (CP) is a disorder that is characterized by developmental delay, postural impairments and movement dysfunction such as manual ability deficits or in coordination. It occurs either in the fetal period or in infancy due to brain insult. Treatments to enhance the manual ability and functional improvement are Physiotherapy, Neuromuscular electrical stimulation, Occupational Therapy, casting & splinting and Pharmacologic agents. Moreover, a possible new rehabilitative approach called Action observation therapy (AOT) that stimulates the motor areas in the brain.

Methodology: RCT study was carried out at National Institute of Rehabilitation Medicine and OASIS physiotherapy and rehabilitation center, Islamabad from January 2018 to July 2018 with total 6 months duration with aim to determine the effect of AOT in functional mobility and manual dexterity of UL in spastic CP. For this 22 patients were selected from which 11 received AOT with routine physiotherapy and remaining 11 were treated with only routine physiotherapy. Both groups received treatment for three sessions per week of 8 weeks. Assessment was done by abilhand kids test and box & block test. With the comparison of pre and post assessment, those patients who received AOT with routine physiotherapy were shown much improvement in their daily actions especially with the dominant hand.

Results: The interventional study was conducted to determine the effects of action observation therapy in patients with cerebral palsy. Results showed significant improvement in AOT group with the p-value <0.05. Mean rank score of Box and Block test with dominant hand in experimental group was 16.45 and in control group mean rank score was 6.55 and mean rank score of Box and Block test with non-dominant hand in experimental group was 16.91 and in control group mean rank score was 6.09 with p value 0.001 that showed statically significant reduction in disability. In this study, AOT group showed more significant improvement on abilhand kids and box and block test (BBT) with p value (< 0.05).

Introduction

A clinical syndrome known as cerebral palsy is a developmental disorder presenting as movement and postural problem.¹ Rosenbaum et al. (2007) explain the CP by stating that defective gross and motor skill functioning and coordination, atypical motor ability, are the key traits of cerebral palsy. These motor impairments can result in problem with gait, feeding and swallowing, coordination of eye movements, speech articulation, and other problems with musculoskeletal dysfunction, attitude,

and participation in communal.² Ndurumo (2002) and Saladin (2004) explained that CP is described by complete loss of movement, decrease strength, loss of coordination or others malformation of the movement control center of the CNS.³

Cerebral palsy (CP) is the one of the major cause of severe bodily disability in early age, almost 2 to 2.5 per 1000 children an estimated prevalence rate in developed states.⁴

In 2008, the prevalence rate was approximately 3.1 per 1000 births by age 8 years in the United States¹ and in 2006 in Sweden, it was 2.2 per 1000 live births.⁵ In developed countries childhood motor disability incidence ratio is 2-2.5/1000 live births, and cerebral palsy is one of common cause.⁶

In developing countries, the prevalence rate 11.2 per 1000 live births of preterm infants was reported in last decade. In Pakistan, strongly associated risk factor with the prevalence of CP is lacking maternal education in population.⁷ Children with critical cerebral palsy and related disorders may have subsequent mediation before progression to adult accommodations: surgical operation to stomach, surgical procedures, BOTOX treatment, and antiepileptic therapy, surgery of hip, spasticity treatment, and surgical correction of scoliosis, artificial or mechanical aid, wheelchair, interlude care, home modifications, and specific education. Moreover, some supplementary penalties that may be concealed because they have no correlation to health care, and so are omitted, or since they are associated with ability deficit rather than outlay.⁸

Cerebral palsy is classified by the type of movement problem i.e. spastic, athetoid, hypotonic or mixed and by involve body parts, it may be tetraplegia / quadriplegia i.e. involvement of all limbs. There are different classifications of CP according to the involvement of body parts, limbs, and movement problem. Classification of movement-related problems includes hypotonia, athetoid, spastic or mixed. Quadriplegia, tetraplegia classified as a body part or all limb involvement.⁹ The warning signs of cerebral palsy are the developmental delay, low or high muscle tone and abnormal posture that help in the definitive diagnosis of cerebral. Medical lab tests are to illustrating the cerebrum by apply computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound are favorable bodily diagnostic tests. Close observation is necessary for rule out the associated impairments like eye and ear disorders, fits, perceiving problem with pain and touch and intellectual impairment and can help to perform full examination and clinical evaluation and to establish the diagnosis.¹⁰ More conciliation has been done on categorization of cerebral palsy in words of the intensity of functional impairment. Likewise, a before decades, Palisano and his fellows invented the GMFCS, which

explains 5 stages of gross motor ability. Other measurements have been invented for fine motor capabilities, such as, the Bimanual Fine Motor Function (BFMF) Classification ,the ABILHAND-Kids, and the Manual Ability Classification System.¹¹ Early danger signs of cerebral palsy such as delay in milestones development, walk on toes, continuous clenching hand, the small size of head, seizure, irritation, bad engulf, dominance of one hand on earlier than the age of 2 year (showing one sided body weakness), and adductor tightening of legs. Moreover, early signs may be the constancy of basic reflexes.¹²

Academy of Cerebral Palsy and Developmental Disability (AAPCPD) currently noticed that the management of CP child depends upon the socioeconomic status, caregiver and environment is more important than his or her justified estate of disease.¹³

There are different interventions and strategies to improve functions of upper limb, include physiotherapy, occupational therapy, motor learning, neurodevelopmental treatment, movement training, virtual-reality training, strength training, soft and rigid splinting, CIMT Constraint induced manual therapy, casting, pharmacologic agents and neuromuscular electrical stimulation.¹⁴

Action observation therapy is another new possible rehabilitative approach for CP child that is used to stimulate the motor areas of the brain and try to improve everyday activities. This therapeutic approach is based on a theoretical frame of the discovery of neurons and its functional abilities which are called "mirror neurons" Action observation therapy is a new advancement in neuro-rehabilitation , valid in neurophysiology, and presenting a well ground model of translational medicine, in neurorehabilitation.¹⁵

Methodology

A single blinded randomized controlled trial was conducted at Department of Physical Therapy, National Institute of Rehabilitation Medicine and OASIS physiotherapy and rehabilitation center, Islamabad, from January 2018 to July 2018 with total 6 months duration with aim to determine the effect of AOT in functional mobility and manual dexterity of UL in spastic CP. Sample size was calculated by OpenEpi tool online. Spastic

cerebral palsy was included with MAS between 1 and 2 of both genders, aged from 5 to 15 years. Ensure that the child understood the desired actions. On the basis of inclusion criteria, 22 participants included in the study. Participants were randomly assigned into two groups by lottery method i.e. Group A (n = 11) and group B (n = 11). For this 22 patients were selected from which 11 received AOT with routine physiotherapy and remaining 11 were treated with only routine physiotherapy. Both group received treatment for three sessions per week of 8 weeks. Assessment was done by abilhand kids test and box & block test.

Group A received the action observation therapy with conventional physical therapy while Group B received the conventional physical therapy including, movement training, eurodevelopmental therapy (NDT) and stretching. Treatment was given for three sessions per week of 8 weeks. Informed consent was taken from all participants in both Urdu and English language.

In Action observation therapy, Video clips were showed with daily actions that required the use of upper limb involving arms and hands, (i.e. grasping an object, using a pencil, pouring water etc.) will be presented for 9 to 12 minutes. After watching of each video clip, child is asked to perform the action so accordingly the child had observed, to the best of his/her capability. Total numbers of video clips were four .Each video clip is comprised of 3 motor action. Total motor action was 12.¹⁴ List of tasks were presented through video clips are coming after. Upper limb functional training actions include,

1. Placing blocks into a carton
2. gripping a pen to sketch a line
3. swing cards upturn down
4. transferring coins into a cash box
5. stacking up mugs
6. Using a ladle
7. unscrewing jar caps
8. closing and opening zippers
9. buttoning up trousers/shirts
10. filling a cup with water
11. rolling up a towel
12. transferring water bottle

This treatment was given in 3 sessions per week for a total of 8 weeks. Each session was of 45 min. Baseline

assessment was done at 0 week and Post-assessment was done after 8 weeks of treatment.¹



Figure 1 Children Placing Blocks in a carton

Conventional physical therapy: Functional physical therapy (Functional physical therapy, as defined is promoting functional skills with Physical therapy). Movement training, Neurodevelopmental therapy (NDT) and Stretching. This treatment was given in 3 sessions per week for a total of 8 weeks. Each session was of 25 min. Baseline assessment was done at 0 week and Post-assessment was done after 8 weeks of treatment.

Results

Among 22 patients there were 77.3% male and 23.7% female in the study. In experimental group 90.9% were male and 9.1% female and in control group 63.6% were male and 36.4% female. Mean age of participants was 8.36 ± 3.499 . In experimental group mean age was 9.00 ± 3.768 and in control group mean age was 7.73 ± 3.259 . In general, 27.3 patients were diagnosed with spastic hemiplegia, 22.7% patients with spastic diplegia while 50.0% patients with Spastic quadriplegia. In the experimental group, there were 36.4 % of patients were diagnosed with spastic hemiplegia, 27.3% with spastic diplegia while 36.4 % were with Spastic quadriplegia. In control group, there were 18.2% of patients were diagnosed with spastic hemiplegia, 18.2% with spastic diplegia while 63.6% were with Spastic quadriplegia.

The Mann-Whitney U test shows P value <.05 that shows that both variables have significant difference within groups. The results of the study show that there is statistical significant difference exist between the groups because p value of all variables is <.05.

In current study pre and post comparison in experimental group (AOT) p value of all variables is $<.05$ which shows there is difference between both conditions. Whereas pre and post comparison in control group (CPT) p value of all variables is $<.05$ (expect non-dominant) which shows there is difference between both conditions. Non-dominant $p>.05$ shows there is insignificant difference in pre and post conditions.

Discussion

This experimental study was conducted to comparison action observation therapy and Functional physical therapy in patients with cerebral palsy. Only 22 patients were recruited in study. 11 patients were included in group A (experimental) and 11 in Group B (control). The interventional study was conducted to determine the effects of action observation therapy in patients with cerebral palsy. Manual dexterity and functional movement were measured by Box and block Abilhand -kids test. Patients followed the study by randomly divided in to

Control and Experimental group. One group received action observation therapy along with conventional treatment and other were treated with only conventional treatment. Results shown significant improvement in AOT group with the p-value <0.05 . Mean rank score of Box and Block test with dominant hand in experimental group was 16.45 and in control group mean rank score was 6.55 and mean rank score of Box and Block test with non-dominant hand in experimental group was 16.91 and in control group mean rank score was 6.09 with p value 0.001 that showed statically significant reduction in disability. In this study, AOT group showed more significant improvement on abilhand kids and box and block test (BBT) with p value (< 0.05).

A Randomized Controlled Trial conducted by TaeHoonKim, et al to find out the Effects of Action Observational therapy Plus Brain Computer Interface Based Functional Electrical Stimulation on Paretic Arm Motor Recovery in stroke patients. Results of study showed that a both AOT plus BCI based FES with

Table I: Comparison of baseline values between experimental and control group

Test variables	Group allotted to patients	Median(Interquartile Range)	Mean Rank	Z value	P value
Dominant	AOT	24(10)	16.45	-3.588	0.001
	Conventional PT	3(4)	6.55		
Non dominant	AOT	14(6)	16.91	-3.924	0.001
	Conventional PT	2(2)	6.09		
ABILhand-KIDS	AOT	29(7)	17.00	-3.983	0.001

Table II: Pre and Post scores of experimental group.

Test Variables	Median(Interquartile Range)AOT	Median(Interquartile Range)AOT	Mean Rank	Z value	P value
Dominant hand	12(9)	24(10)	6.00	-2.943	0.003
non dominant	8(7)	14(6)	6.00	-2.943	0.003
AABIL HAND KIDS	16(9)	29(7)	6.00	-2.955	0.003

Table III: Pre and post scores of control group.

Test Variables	Median(Interquartile Range)CPT	Median(Interquartile Range)CPT	Mean Rank	Z value	P value
Dominant	1(4)	3(4)	3.50	2.264	0.024
Non dominant	1(2)	2(2)	1.50	-1.342	0.180
AABIL Hand KIDS	1(7)	3(5)	3.50	-2.264	0.024

conventional therapy are effective than only conventional therapy, in improving arm motor performance. This combination of therapy plays significant role in reducing motor impairments and also improves motor activity of upper limb in stroke patients.¹⁶

Another study conducted by Kirkpatrick et al to determine the effects of parents delivered AOT on upper extremity function in hemi sided cerebral palsy children. Results were, Combined-group improvements in combine group was ($p<0.001$), observed in Assisting Hand Assessment and Melbourne Assessment at 3 months, were sustained at six months. On ABILHAND-Kids test, results also showed that improvement at 3 months ($p=0.003$), sustained at six months. Continuous practice with Action observation and without AOT which delivered by parents was effective in upper limb function and could be alternative therapist input.¹⁷ Results of this study shows significant improvement in AOT group with the p-value <0.05 . Mean rank score of Box and Block test with dominant hand in experimental group was 16.45 and in control group mean rank score was 6.55 and mean rank score of Box and Block test with non-dominant hand in experimental group was 16.91 and in control group mean rank score was 6.09 with p value 0.001 that showed statically significant reduction in disability. In this study, AOT group showed more significant improvement on abhilhand kids and box and block test (BBT) with p value (< 0.05).

Giuseppina Sgandurra conducted a RCT to determine the influence of Action observation therapy (AOT) in the Upper extremity of CP Children. The properties of the mirror neuron system suggest a new type of upper limb (UL) rehabilitation in children with unilateral cerebral palsy (UCP), based on observation of action therapy followed by execution of a variety of observed movements (AOT). In a randomized, block-designed, evaluator-blinded trial, 24 upper limb cerebral palsy children with mild to moderate hand disorder were divided into two groups. The experimental group watched video clips of unimanual and bimanual goal-directed activities and then subsequently performed same actions with either only hemi paretic upper extremity or with both upper extremities for one hour per day for three successive weeks. The control group executed the actions likewise in the similar sequence as the

experimental group, but had observed computer games. The primary outcome measure was Assisting Hand Assessment (AHA) scale while the ABILHAND-Kids and Melbourne assessment were secondary measure. Results were evaluated at first week, eighth weeks, and 24th week after the completion of the treatment. The significant improvement in the experimental group was more ($P = .008$) in score variations for the Assisting Hand Assessment (AHA) at the primary final 1st week ($P = .008$), 8th week ($P = .019$), and 24th week ($P = .049$). Significant changes were not found for Melbourne assessment scale and ABILHAND-Kids. Action observation therapy with upper limb in cerebral palsy child were found to be effective for daily activities of upper extremities, revealing a advance rehabilitation approach on the basis of the neurophysiological model of motor learning.¹⁸ Results of this study shows significant improvement in AOT group with the p-value <0.05 . In this study, AOT group showed more significant improvement on abhilhand kids and box and block test (BBT).

Conclusion

Action observational therapy approach is a novel approach. It is concluded that this study shows that AOT has a positive effect on the manual abilities of the upper limbs in CP children. It is concluded that AOT is another approach that help to improve the manual dexterity and function and could be practical for CP child rehabilitation.

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The authors must disclose all financial and personal relationship that might bias their research work along with submission of manuscript.

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This section should contain the purpose of the article after giving a brief literature review strictly relevant to the objective of the study. A summarized rationale of the study or the observation should be given here as well. It is

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All the components of the methodology including; study design, selection of observational or experimental subjects, (i.e. patients or laboratory animals including control) must be mentioned in this section. Mention study setting, duration, sampling techniques, sample size calculations with reference and follow up period. Provide the inclusion exclusion criteria, if applicable without adding any headings. Identify the methods, apparatus (give the manufacturer's name and address in parenthesis) and procedures in sufficient details to allow other workers to reproduce the results.

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The recommended reference style is **VANCOUVER** and the reference number should be in superscript in the text. References must be numbered sequentially as they appear in the text. References cited in the tables or figures (or in their legends and footnotes) should be numbered according to the place in the text where that table or figure is cited first. Please note that if references are not cited in order, the manuscript may be returned for amendment before it is passed on to the editor for review.

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Images must be uploaded as separate files. All images should be cited within the main text in numerical order and legends should be provided at the end of the manuscript. Photographs, X-rays, CT scans, MRI and photo micrographs must be in digital format with a minimum resolution of 3.2 mega pixels in JPEG compression. Scanned images should have a resolution of 300dpi or more. During submission, ensure that the figure files are labeled with correct files designation of "Mono Image" for black and white figures and "Color Image" for color figures. Photographs captured through cell phone cameras are not acceptable. All original photographs (should not manipulated) with neutral background (white background is preferred) must be submitted. Figures are checked using automated quality control and if they are below the minimum standard you will be alerted and asked to resupply them. Please ensure that any specific patient/hospital details are removed or blocked out (e.g. X-rays, MRI scans etc). Figures that use a black bar to obscure a patient's identity are not accepted. Photographs of patients if sued, should be either un-identifiable or written permission should be attached there.

14. Tables and Illustrations

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cited. Tables must be cited in numerical order. Please note that tables embedded as Excel files within the manuscript are not acceptable. Tables in Microsoft Excel should be copied and pasted in the manuscript Word file. The tables should be self explanatory and the data they contain must not be duplicated in the text or figures. Each table should have a title and be typed with double space on an 8.5" x 11" (21.5 x 28 centimeters) paper without horizontal and vertical lines. Any tables submitted that are longer/larger than two pages will be published as online only supplementary material. Each table must be numbered with Roman numeral with respect to the order of its citation in the text. The number should be written in the upper right corner. Any abbreviations if used should be supported with the proper explanation in the form of foot note. Where graphs scatter diagrams, histograms or any other diagrams are used, the relevant data must also be submitted.

15. Ethical Considerations

If some illustrations or photographs, which have already been published, are used in the article, a permission letter for publication from the author of the original material as well as from the editor of the journal where that material was originally published must be obtained. Do not use patient's names, initials or hospital numbers in the text and illustrative materials. Written permission to reproduce the photographs of the participants whose identity is not distinguished should be sent with manuscript; otherwise the eyes will be blackened out.

While reporting experiments on human subjects indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentations and with the latest ethical standards or not. Similarly, while reporting experiments on animals, it is also necessary to indicate whether the institution's or a national research council's guide for or any national law on the care and use of laboratory animals was followed or not. Please document that the study was approved by the ethical review board of committee of the concerned university/institution. Also informed consent of the subjects studied should be clearly stated. If institution does not have an ethical review committee then the institution's approval from concerned department may be submitted. These documents are required for all categories of the articles.



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