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CHAPTER 2- REVIEW OF LITERATURE

2.1 PROBLEMS OF CHRONIC ALCOHOLICS

Our present knowledge of chronic alcoholism can be most constructively utilized clinically if we keep in mind the intensity of the problem, the malignancy of the illness and the prejudices and pessimism that are generally prevailing and to be overcome in organizing effective rehabilitation and treatment programmes.

However like any neurotic symptom or character trait, alcoholism serves to affect a shaky balance of physiological and psychological ratification. The infantile, immature character of the alcohol’s behavior in seeking these uncertain pleasures through excessive drinking leaves no doubt that the alcoholic patient is driven by compelling irrational unconscious needs. Consciously and rationally the alcoholic patient is full of good intentions to stop drinking or to drink in a controlled sensible, acceptable fashion.

In any instance it is altered behavior and impaired interpersonal relationship that brings the alcoholic patient to grief and blocking achievement of his life’s objectives. For the alcoholic excessive drinking is used to satisfy an insatiable need, eventuating in dependency upon alcohol (i.e., search for security, homeostasis, increased self-esteem or satisfaction, competitive drive for superiority, protection against anxiety and helplessness in a hostile world, or avoiding the castration anxiety. The progressive addiction to alcohol will gradually nullify all other interests in the patient’s life so that a deterioration of the physical, psychological, social, cultural and religious values takes place.

The detailed management of acute alcoholism, the hangover, alcoholic gastritis (acute and chronic) and associated hepatic disease, cardio-vascular disorders, skin manifestations, vitamin deficiency and polyneuritis require great emphasis and in treating these conditions the physical attitude towards the alcoholic patient is of crucial importance in paving for continued effort by the patient to help himself avoid relapses into drinking.

So any amount of extra work carried out and data collected to help the alcoholics would be received well to chart out a better management programme for enhancing relapse and alleviate the symptoms.
The effective renunciation of alcohol is not easy for the alcoholic. He must acquire a transformation of motivation towards his life values and insight into himself that the surrender of alcohol will bring him new and deep emotional convictions allowing him to take a useful and enduring role in human relations. The importance of counseling and rehabilitation arrives at this stage which is called conversion experience. It is about insight gaining through learning about oneself.

The alcoholic is accessible to beginning favorable influence in the period of suffering and guilt which follows a typical alcoholic debauch if the approach offers him understanding and a constructive alternate to alcohol. Regular meetings with the counselor reduce tensions of the alcoholic. Weekly meetings are recommended when the alcoholic is encouraged to examine his family relationship, his job and community situation realistically with an eye to the possible improvement. With the assent of the patient, reliable relatives can be made allies in aiding the patient to build a constructive non-alcoholic life. They should be taught that the patient's alcoholism is a manifestation of illness and that a tolerant friendly attitude will in the long run pay-off. The criticism and accusation directed to the patients are likely to achieve nothing except an increase on his drinking.

Group psychotherapy:

Inspirational and supportive group therapy allows alcoholics to gain reassurance in learning that others have similar problems and that others have been in as much difficulty as he. In such an atmosphere there develops mutual assistance which the alcoholic appreciates and gains support in abstaining from alcohol. Didactic and instructive group therapies are done with considerable success in helping the alcoholics to remain sober.

The etiology of alcoholism is complex and multiple factors are involved. The essence the problem related to alcoholism is certainly altered behavior upsetting the inter-personal relations and is therefore psychological in nature. The attitude of the therapist is basic in achieving cooperation from the alcoholic patient. The process is often challenging, prolonged and painful for the patient and counselor (Anthony Zappala, 1954).

Hence we sought to incorporate yoga along with psychological counseling and make it a double ended approach to achieve promising results.
2.2 YOGA AND ITS BENEFITS

Dating back over 5000 years, yoga is the oldest defined practice of self development. The methods of classical yoga include ethical disciplines, physical postures, breathing control and meditation. Traditionally an Eastern practice, it's now becoming popular in the West. In fact, many companies, especially in Britain, are seeing the benefit of yoga, recognizing that relaxed workers are healthier and more creative, and are sponsoring yoga fitness programs.

OVERVIEW OF YOGA

Many of the popular techniques found to reduce stress derive from yoga, controlled breathing, meditation, physical movement, mental imagery and stretching.

1) Heart Disease Prevention

Stress is a probable risk factor for heart disease, the leading cause of death in the United States today. Results revealed that yoga may decrease many cardiovascular disease risk factors (including high blood pressure and oxidative stress, a process involved in hardening of the arteries) and might aid in the management of cardiovascular disease (Innes et al., 2005).

2) Maintaining a Healthy Weight

A regular yoga practice could help ward off the weight gain that often accompanies aging, suggests a 2005 study by Kristal et al. In surveying 15,500 healthy, middle-aged men and women, researchers found that most participants gained about a pound a year between ages 45 and 55. However, study members who were of normal weight at age 45 and practiced yoga on a regular basis (at least 30 minutes once a week for four or more years) gained about three fewer pounds during that 10-year period than their non-yoga-practicing counterparts.

For help in cultivating a yoga practice that promotes weight loss or weight maintenance, the study's authors recommend working at an intensity where you feel challenged but not overwhelmed (Kristal et al., 2005).

3) Easing Anxiety and Depression

People with anxiety and depression tend to have low levels of the brain chemical gamma-aminobutyric acid (GABA). But practicing yoga could help boost GABA levels, according to a 2007 study by Streeter et al. Researchers measured
GABA levels of eight volunteers before and after an hour of yoga, and then compared them to the GABA levels of 11 people who read for an hour instead of doing yoga. While study members showed no change in GABA levels after their reading session, the yoga-practicing participants had a 27% increase in this mood-regulating amino acid (Streeter et al., 2007).

4) Building Balance

Among people ages 65 and older, falls are the leading cause of nonfatal injuries. In a 2008 study, (http://www.temple.edu/newsroom/2007-2008/04/stories/yogagait.htm), 24 elderly women showed significant improvements in balance and stability after completing a nine-week yoga program created specifically for their age group. Those gains in physical functioning -- which also included increases in walking speed and flexibility in the lower extremities -- could help to prevent falls, according to the study's authors.

5) Back Pain Relief

Yoga might be more effective than conventional exercise in relieving low back pain, finds a 2005 study of 101 adults. After 12 weeks, study members who took part in weekly yoga sessions had an easier time completing back-related daily activities than those who performed weekly aerobic, strengthening, and stretching exercises. After 26 weeks, the yoga-practicing study members also had better back-related function and less pain than other participants (Sherman et al., 2005).
2.3 YOGA AND STRESS

Yoga, which derives its name from the word, “yoke”—to bring together—does just that, bringing together the mind, body and spirit. But whether you use yoga for spiritual transformation or for stress management and physical well-being, the benefits are numerous.

YOGA’S EFFECTS ON THE BODY

The following is only a partial list of yoga’s benefits: reduced stress, sound sleep, reduced cortisol levels, improvement of many medical conditions, allergy and asthma symptom relief, lower blood pressure, smoking cessation help, lower heart rate, spiritual growth, sense of well-being, reduced anxiety and muscle tension, increased strength and flexibility, slowed aging process.

Yoga’s benefits are so numerous; it gives a high payoff for the amount of effort involved.

WHAT’S INVOLVED WITH YOGA?

The practice of yoga involves stretching the body and forming different poses, while keeping breathing slow and controlled. The body becomes relaxed and energized at the same time. There are various styles of yoga, some moving through the poses more quickly, almost like an aerobic workout, and other styles relaxing deeply into each pose. Some have a more spiritual angle, while others are used purely as a form of exercise.

WHAT ARE THE BENEFITS OF YOGA?

Virtually everyone can see physical benefits from yoga, and its practice can also give psychological benefits, such as stress reduction and a sense of well-being, and spiritual benefits, such as a feeling of connectedness with God or Spirit, or a feeling of transcendence. Certain poses can be done just about anywhere and a yoga program can go for hours or minutes, depending on one’s schedule.

WHAT ARE THE DRAWBACKS OF YOGA?

Yoga does require some commitment of time and is more difficult for people with certain physical limitations. Some people feel self-conscious doing some of the poses. Also, yoga classes can be expensive, although it is possible, albeit perhaps more challenging, to learn from a book or video.
HOW DOES IT COMPARE TO OTHER STRESS REDUCTION METHODS?

As yoga combines several techniques used for stress reduction, it can be said to provide the combined benefits of breathing exercises, stretching exercises, fitness programs, meditation practice, and guided imagery, in one technique. However, for those with great physical limitations, simple breathing exercises, meditation or guided imagery might be a preferable option and provide similar benefits. Yoga also requires more effort and commitment than taking pills or herbs for stress reduction (West et al., 2004; Brown and Gergerg, 2005, Granath et al., 2006).

2.4 YOGA AND ADDICTION STUDIES

The advantages of yoga in addictions have been published by certain authors (Sharma and Shukla, 1988, Nespor, 2005, Kochupillai et al., 2005).

2.5 YOGA IN ALCOHOLICS

The usefulness of yoga alone (without counseling) in alcoholics has been reported by Benson, (1974), Swinyard et al. (1974), Subrahmanyan et al. (1986); Nespor, (1990), Head, (2006, Vedamurthachar, (2006).

Breath and Prana:

Breathing is a vital process which starts at the time of birth and stops at the death. The important Oxygen is provided to all the parts, organs and cells of the body. The maximum time a person can survive without oxygen is about 4 minutes. All the metabolic processes require oxygen. Oxygen is life, a vital force. This vital energy is called Prana.

Pranayama:

The process of controlling the Prana is called Pranayama. So pranayama is the science related to vital force supplying energy and controlling the body mind complex.

**Pranayama or Yogic breathing:** During breathing for Pranayama inhalation (puraka) stimulates the system and fills the lungs with fresh air, retention (kumbhaka) raises the internal temperature and plays an important part in increasing the absorption of oxygen; exhalation (rechak) causes the diaphragm to return to the original position and air full of toxins and impurities is forced out by the contraction of inter-costal muscles. These are the main components leading to Pranayama which massage the abdominal muscles and tone up the working of various organs of the body. Due to the
proper functions of these organs, vital energy flows to all the systems. The success of Pranayama depends on proper ratios being maintained between inhalation, exhalation and retention.

Breathing is the process of taking in this vital energy and removing the waste products out of our body and mind. The air can be retained in the lungs or out of the lungs. The ancient texts say that retention of air, increases the level of prana (energy) in the body, also it regulates the flow of pranic energy through out the body. So pranayama helps to remove all the ailments and also can probably prolong the aging process of the body.

Mind and breath:

The mind, consisting of thoughts and emotions is closely related to the breath. When the mind is calm and relaxed, the breathing is smooth and slow and when the mind is stressed breathing is fast & shallow. In this way, the mental and emotional states affect breathing.

Physiology of Yogic breathing:

In process of breathing, one uses diaphragm, intercostal muscles in the chest. The diaphragmatic breathing is called vertical breathing and is considered a more efficient way to inhale air than inhaling while expanding the chest which is called horizontal breathing. In pranayama, one should utilize the diaphragm efficiently to get more oxygen without making more efforts. The diaphragm is attached to the organs like heart and lungs, also the liver, spleen, pancreas and stomach from the bottom side. Efficient movement of the diaphragm makes the functioning of these organs more efficient.

Rhythmic Breathing is Pranayama:

All the processes and organs like heart, brain, digestive organs, and endocrine glands in the body have rhythms. Also the breathing has specific rhythms. Pranayama is Rhythmic breathing, bringing the breath in natural rhythm by controlling the process of inhalation, exhalation and retention.

Stanescu, 1990, Sequeira, 1999, Roggla et al., 2001, have reported the effect of yoga and pranayama on various systems. Gupta et al. (2006) have reported the role of pranayama on stress. The role of pranayama in reducing stress. In pranayama our mind is focused on the breath. The only dynamic process is breathing. The true aim of
the various techniques and breath ratios of breathing in pranayama is first and foremost to give us many different possibilities for following the breath. When we follow the breath, the mind is drawn into the activities of the breath.

**Alcohol and Stress:**

Stress may be linked to social drinking, and the physiological response to stress is different in actively drinking alcoholics compared with non-alcoholics (Wand and Dobs, 1991). Researchers have found that animals preferring alcohol over water have a different physiological response to stress than animals that do not prefer alcohol (Ehlers, 1995). Nonetheless, a clear association between stress, drinking behavior, and the development of alcoholism in humans has yet to be established. There may, however, in the already established alcoholic, be a clearer connection between stress and relapse. Among abstinent alcoholics, personally threatening, severe, and chronic life stressors may lead to alcohol relapse (Brown et al., 1990, 1995). Some studies have reported that acute exposure to low doses of alcohol may reduce the response to a stressor in animals and humans. For example, low doses of alcohol reduced the stress response in rats subjected to strenuous activity in a running wheel (Kalant, 1990). In humans, a low dose of alcohol improved performance of a complex mental problem-solving task under stressful conditions (Kalant, 1990). However, in some individuals, at certain doses, alcohol may induce rather than reduce the body's stress response (Waltman et al., 1993).

Much research demonstrates that alcohol actually induces the stress response by stimulating hormone release by the hypothalamus, pituitary, and adrenal glands (Eskay et al., 1993; Tsigos and Chrousos, 1995). This finding has been demonstrated in animal studies. In one study with rats, the administration of alcohol initiated the physiological stress response, measured by increased levels of corticosterone (Spencer and McEwen, 1990). In addition to stimulating the hormonal stress response, chronic exposure to alcohol also results in an increase in adrenaline (Rivier et al., 1990).

The sympathetic skin response (SSR) is a slow wave, generated in deep layers of the skin, resulting from reflex activation of the sudomotor sympathetic efferent fibers. This slow galvanic reflex response is known to occur following a deep breath, an unexpected or arousing stimulus (Elie and Gutheneuc, 1990). Its possible clinical uses in the diagnosis of autonomic disorders are gaining importance. As the spontaneous response is a relatively new, inadequately worked out parameter in
alcoholics, the measurements were evaluated in the present study before and after pranayama

There are many varieties of pranayama, but the alcoholic subjects could not be motivated to do many due to their physical condition. It was decided to limit the pranayama to only one.

**ANULOMA VILOMA PRANAYAMA AND STRESS**

The exercise of the Anuloma Viloma produces optimum function to both sides of the brain that is optimum creativity and optimum logical verbal activity. This will make both sides of the brain, the left side which is responsible for logical thinking and the right side which is responsible for creative thinking to function properly. This will lead to a balance between a person's creative and logical thinking. The Yogis consider this to be the best technique to calm the mind and the Nervous System. Medical science has recently discovered the nasal cycle, something that was already discovered by the Yogis thousands of years ago. Modern scientists found out that we do not breathe equally on both nostrils that are one nostril is much easier to breathe through than the other at any particular time. Each nostril alternates about every three hours. Scientists also discovered that the nasal cycle corresponds with brain function. The electrical activity of the brain was found to be greater on the side opposite the less congested nostril. The right side of the brain controls creative activity, while the left side controls logical verbal activity. The research showed that when the left nostril was less obstructed, the right side of the brain was predominant. Test subjects were indeed found to do better on creative tests. Similarly when the right nostril was less obstructed the left side of the brain was predominant. Test subjects did better on verbal skills.

Literature review has revealed the importance of Anuloma Viloma Pranayama in reducing stress. Ancient yogic texts have described a rapid breathing cleansing practice (Kapalabhati) as stimulating, and slow regulated breathing, particularly through alternate nostrils (nadisuddhi pranayama) as calming (Funderburke, 1977). These descriptions have been substantiated by scientific studies. Kapalabhati was found to cause "autonomic activation". This was observed as an immediate effect during three contiguous sessions of 5 min each, in terms of an increased heart rate and systolic blood pressure during Kapalabhati (Stancak et al., 1991). In contrast, nadisuddhi pranayama practiced for four weeks, caused decreased heart rate, as well
as systolic and diastolic blood pressure levels (Bhargava et al., 1988). Anuloma/Viloma / NadiSuddhi pranayama (Raghuraj et al., 1988) has been reported to have calming effects in normal subjects, it involved alternate nostril breathing which many alcoholic subjects could practice.

Thus chronic alcoholics are known to suffer from the physical and psycho social effects of drinking. Medication and counseling plays a major role in rehabilitation. It was our attempt to look at the possibility of using a simple pranayama technique to help alcoholics overcome the challenges of stress. Anuloma Viloma breathing technique was chosen for its simplicity and its effects to improve brain circulation. Chronic alcoholics could master this method easily. Complicated breathing techniques couldn’t be attempted and taught to the inpatients of Vailankanni ward.

Anuloma Viloma breathing technique is extremely useful for diabetes, asthmatics and its usefulness in chronic alcoholics to reduce stress was proposed to be tested.

2.6 YOGA AND COUNSELING

Yoga and counseling has been used in disorders like epilepsy, lipid per oxidation, pain reduction (Marson et al., 2009, Yadav et al., 2006; Katz and Rothenberg, 2005). The authors in their study explored the group as a source of change in mindfulness-based stress reduction (MBSR) in hospital programs or psychotherapies (Imel et al., 2008). They have discussed the effects of group counseling on stress related disorders.

2.7 YOGA AND COUNSELING IN ALCOHOLICS

As technology reveals new realms in diagnosis and treatment, research methods are trying to explore on the new tracks of multi dimensional approach to treat alcoholism, other than the age old practice of drug therapy.

Studies examining spiritually augmented cognitive–behavioral therapies, forgiveness interventions, different meditation approaches, 12-step fellowships, and prayer have provided some evidence, albeit modest, of efficacy in improving health under specific conditions.
Meditation is viewed as a technique for inducing altered states of consciousness are reviewed (Deane et al., 1978; Walsh, 1983; Eisenberg et al., 1993; Shampo, 1994).

2.8 ANIMAL MODELS

These have been very useful in determining the harmful side effects of alcohol on various systems. These models have been very useful in understanding the effect of alcohol on cardiovascular system, skeletal muscle, autonomic nervous system, and blood and biochemical parameters (Guzzetti et al., 2007; Lindholm et al., 2007; Swarnaka et al., 2007; Hashimoto and Waren, 2007; Matsuse et al., 2007; Ren, 2007; Bykov, 2007; Lai et al., 2007; Jung et al., 2007).

2.9 HUMAN STUDIES

Human studies have also revealed the effects of alcohol on various systems (LaPorte et al., 1980; Cohen et al., 1993; Holbrook and Barrett-Connor, 1993; Zhang et al., 2000).

LITERATURE REVIEW OF THE PARAMETERS STUDIED

2.10 QUALITY OF LIFE IN ALCOHOLICS

Many million of people of all ages, socio-economic classes and races have serious problem with alcohol. The physical fitness in chronic alcoholics has been determined by questionnaires and reported to be reduced (Gary and Guthrie, 1972; Murphy et al., 1972). The Quality of Life questionnaire (QOL) has not been used in alcoholics of the Indian population. Assessment of QOL in alcoholics is a valuable measure of clinical status. It also helps to identify predictors of relapse in alcoholics. Donovan et al. (2005) have described quality of life as an outcome measure in alcoholism treatment.

The use of quality of life questionnaire in India for cardiac failure has been reported by Ramachandran et al. (2007).

2.11 PHYSICAL FITNESS

PHYSICAL FITNESS

It is the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist diseases and to meet emergency situations.
Fitness can also be divided into five categories: aerobic fitness, muscular strength, muscular endurance, flexibility, and body composition.

**Cardio respiratory Endurance (Cardio respiratory Fitness):**

It is the ability of the body's circulatory and respiratory systems to supply fuel during sustained physical activity (USDHHS, 1996 as adapted from Corbin & Lindsey, 1994). Walking, swimming, or bicycling improves the cardio respiratory endurance.

**Muscular strength:**

It is the ability of the muscle to exert force during an activity (USDHHS, 1996 as adapted from Wilmore & Costill, 1994). Muscle strength is what happens when the nervous system communicates a message to the muscle fibers to contract so as to produce force. Often the force produced by a muscle contraction is against resistance. To make muscles stronger, working them against resistance (whether that be from weights or gravity) is necessary. E.g.: lifting weights or rapidly taking the stairs.

**Muscular Endurance:**

It is the ability of the muscle to continue to perform without fatigue (USDHHS, 1996 as adapted from Wilmore & Costill, 1994). Muscle endurance is the capacity of a muscle or a group of muscles to perform repeated contractions against a given load for a long period. Muscle endurance can be improved by walking, jogging, bicycling, or dancing.

**Body Composition:**

It refers to the relative amount of muscle, fat, bone, and other vital parts of the body (USDHHS, 1996 as adapted from Corbin and Lindsey, 1994).

**Flexibility:**

It is the range of motion around a joint (USDHHS, 1996 as adapted from Wilmore & Costill, 1994). Good flexibility in the joints can help prevent injuries through all stages of life. To improve your flexibility, activities that lengthen the muscles such as swimming or a basic stretching program should be tried.
This study hopes to analyze the physical fitness in alcoholics by 6 minute walk test and cardiac efficiency by Harvard's step tests which are more reliable than questionnaires. The other advantages of the physiological parameters like 6 minute walk test and Harvard's step test are that they are unique, quantifiable, are not self-reported and could give us an idea of the exact reduction in physical fitness.

The 6 Minute Walk Test (6 MWT) has been reported for pulmonary hypertension, congestive cardiac failure, in elderly, left ventricular failure and in Cardiomyopathy (Guyatt et al., 1985; Bittner et al., 1993; Lucas et al., 1999; Cahalin et al., 1996; Zueck et al., 2000; Opasich et al., 2001). The most popular clinical exercise tests in order of increasing complexity are stair climbing, a 6MWT, and a shuttle-walk test, detection of exercise-induced asthma, a cardiac stress test and a cardiopulmonary exercise test (Weisman and Zeballos, 1994, Wasserman et al., 1999) With a good quality-assurance program, with patients tested by the same technician, and after one or two practice tests, short-term reproducibility of the six minute walk test is excellent (Cahalin et al., 1995).

6 minute walk test, Muscle strength, Endurance, in alcoholics. Physical fitness (6-minute walk test), Muscle strength and Muscle endurance have not been quantified or measured in chronic alcoholics. Physical fitness of alcoholics has been only determined so far by questionnaire. This study hopes to analyze the physical fitness in alcoholics by 6 minute walk test which are more reliable than questionnaires. The other advantages of the physiological parameter like 6 minute walk test is that they are unique, quantifiable, are not self-reported and could give us an idea of the exact reduction in physical fitness. The 6 Minute walk test has been used to compare CHF conditions with different sex, age and BMI distribution (Butland et al., 1982; Holden et al., 1992; Kadikar, 1997, Solway et al., 2001, Balashov et al., 2007; Bajraktar et al., 2009).

Lacunae: Physical fitness, cardiac efficiency, muscle strength, muscle endurance are common parameters which denote the well-being of the individual. Hence these parameters when compared before and after counseling and yoga will unravel the possible changes that can be reverted in chronic alcoholics in order to improve their standard of living.
2.12 CARDIAC EFFICIENCY IN ALCOHOLICS:

Cardiac efficiency

It is the ability, capability or competence of the heart to pump adequate amount of blood and maintain the necessary cardiac output. It is the ratio between cardiac work and myocardial oxygen.

Cardiac efficiency is thus the ratio of cardiac work (pressure-volume area [PVA]) and myocardial oxygen consumption (MVO$_2$). Cardiac efficiency is the ratio between energy output (work) and energy input (myocardial oxygen consumption [MVO$_2$]) for the heart. Currently, the most accepted definition of total cardiac work is pressure-volume area (PVA), the sum of external mechanical work and the potential energy triangle (Suga, 1979). Importantly, MVO$_2$ is linearly related to PVA. Extrapolation of this linear relationship to 0 works gives unloaded (PVA independent) MVO$_2$, the oxygen cost of excitation-contraction coupling and basal metabolism. Furthermore, the inverse slope of the MVO$_2$-PVA relationship defines the contractile efficiency.

In this study it is proposed to analyze the cardiac efficiency of chronic alcoholic patients as controversial reports are available for the beneficial effect of moderate doses on heart. Some reports have shown that alcohol consumption has no effect on the cardiac efficiency of the alcoholic subjects who are manual workers. Review of literature has shown that exercise test has been used to test the efficiency in alcoholics (Corovic et al., 1987; Moskowitz, 1991; Kyshko, 1996). Contrary to normal expectations, the cardiac efficiency was found to be normal in chronic alcoholics who were manual workers (Heitzler and Eremic, 1998). Cerqueira et al., 1991 has also reported rarity of alcoholic cardiomyopathy in chronic alcoholics less than 40 years. Moreover, studies have reported that alcohol can cause a reduction in coronary heart disease. (Freedman GD and Klatsky, 1993, Pearson and Terry, 1994, Vogel, 2002). Moderate consumption of alcohol has a cardio-protective effect (Stampfer et al., 1988, Klatsky, 1990, Klatsky et al., 1990; Rimm EB et al., 1991).

During stress testing, the transitory hypertensive alcohol dependent women had increased diastolic BP, a higher peripheral resistance index, and a reduced cardiac efficiency index relative to the normotensive and control subjects.

The reduced Cardiac Efficiency in chronic alcoholics has been reported by the few authors (Segel, 1988; Vary and Lang, 2001, Bernardy et al., 2003).
Lacunae: Review of literature indicates that there is no data available on physical fitness and cardiac efficiency on alcoholics done using simple, inexpensive instruments and which can be repeated over time (reproducible). This study hopes to analyze the physical fitness in alcoholics by 6 minute walk test and cardiac efficiency by Harvard's step tests which are more reliable than questionnaires. The other advantages of the physiological parameters like 6 minute walk test and Harvard's step test are that they are unique, quantifiable, are not self-reported and could give us an idea of the exact reduction in physical fitness.

2.13 MUSCLE STRENGTH ENDURANCE IN ALCOHOLICS

Also, though muscle weakness is known to occur in alcoholics, individual muscle strength and endurance have not been determined in chronic alcoholics (Carlsson, 1967, Tarter et al., 1987). To create more quantitative assessments of hand muscle strength, dynamometers have been developed. Hand dynamometer is a reliable instrument to measure intrinsic hand muscles strength in patients (Schreuders et al., 2004).

These dynamometer measurements are more sensitive to change compared to manual muscle testing and render outcome on a continuous scale. In clinical evaluation and research studies on patients with hand problems, muscle strength measurements are usually based on grip strength dynamometry. The most commonly used grip dynamometers are the hand dynamometers. In several patients groups, these measurements have a good reliability and validity. By comparing outcome with normative data, the amount of muscle strength loss can be determined.

Isokinetic and isometric muscle strength and endurance were determined after the ingestion of alcohol to superimposed external electrical stimulations during voluntary contractions and a reduced activation of the central motor pathways were reported by Poulsen et al. (2007).

The effect of alcohol on muscle protein (Ishiko et al., 2001), muscle metabolism, muscle enzyme (Adachi et al., 2001, Cunningham et al., 2001), muscle genetic (Tatsuo et al., 2003, Reilly et al., 2000), muscle apoptosis (Hsieh et al., 2000, Cowled et al., 2001; Pace et al., 2003) and Myopathy (Marway et al., 1990, Urbano-Marquez et al., 1995; Preedy et al., 1997 and 2001) have been studied.

Lacunae: Physical fitness, cardiac efficiency, muscle strength and muscle endurance are common parameters which can denote the well being of the individual. Hence
these parameters when done before and after counseling and yoga will unravel the possible changes that can be reverted in chronic alcoholics in order to improve their standard of living

2.14 AUTONOMIC PARAMETERS

2.14 a. Tests for autonomic parameters:

1. Cardio vagal tests
   Heart rate variation to deep breathing, valsalva ratio, 30:15 ratio.

2. Adrenergic tests
   Beat to beat BP response (cold pressor test), GSR, blood pressure response to tilt-up test

3. Sudomotor tests
   QSART- Quantitative Sudomotor Axon Reflex Test, thermoregulatory sweat test

   For conducting tilt up test, the patients who have history of syncope only have to be chosen. Since very few patients (only 2) reported with syncope, this parameter couldn’t be studied. The Sudomotor tests are far too advanced and are used as confirmatory tests. Hence they couldn’t be done. QSART is done only for testing small C-fiber activity linked with sweat glands and they are generally done in patients with neuropathy. But for future studies if the necessary software are available, they will be taken for study.

   Thus cardio vagal and two of the adrenergic tests (CPT and GSR) were taken for the study.

   Also since our study comprised of many parameters other than autonomic nervous system, the Ethical committee recommended most important tests as the patients were very drunk during admission and their co-operation would become difficult if long hours and battery of tests have to be performed on the same individual. Ethically also it was not possible to stress the patients long. The patients were admitted for only 4 weeks and had a rigorous routine and their availability for research activities was restricted. Other than investigations, they had meticulous social and counseling activities throughout the week.
2.14 b. SYMPATHETIC NERVOUS SYSTEM ACTIVITY

Galvanic skin resistance and cold pressor test

Galvanic skin resistance in alcoholics. Galvanic skin resistance (GSR) which measures the resistance across the skin of an individual depending on his/her sweating. The measurement used in our study has been done with the intention of quantifying stress in alcoholics. GSR values along with Cold pressor test values will express a bi-dimensional view on the sympathetic status in the alcoholics.

2.14 c. HEART RATE VARIABILITY IN ALCOHOLICS

Chronic alcohol intake causes, amongst numerous systemic damages, also the autonomic nervous system (ANS) dysfunction, which causes the autonomic heart rate regulation disorders. The aim of the study was to evaluate the autonomic dysfunction in chronic alcoholism. In contrast to diabetic autonomic neuropathy, cardiovascular autonomic neuropathy (CAN) in long-term alcoholics has been studied rarely. To assess the nature of disturbance, we chose to look at the heart rate variability in alcoholics. Reduced HRV has thus been used as a marker of reduced vagal activity, the parasympathetic component of the autonomic nervous system. A comparison of GSR and HRV could throw light on the extent of sympathetic and parasympathetic damage in chronic alcoholics.

The harmful effects of alcohol on the heart occur primarily with heavy drinking. Heavy consumption of alcohol appears to affect heart muscle and possibly arterial tissues directly (Moore and Pearson, 1986) Alcoholic cardiomyopathy is a common diagnosis in long-term alcoholics (Colditz et al., 1985, Diamond, 1989).

Diseases related to heavy consumption of alcohol include stroke (Stampfer et al., 1988) alcoholic cardiomyopathy, (Segel, 1987) several kinds of cancer, cirrhosis, and pancreatitis, as well as accidents, suicide, and homicide. The deleterious effect of alcohol includes dilated cardiomyopathy, dysrhythmias and hypertensive heart disease. It should be noted that heavy consumption of alcohol is a major cause of hypertension (Klatsky et al., 1977), so that the diseases related to hypertension, such as stroke, are generally related to alcohol consumption.

The measured heart rate is modulated by two main components of autonomic nervous system. These are parasympathetic and sympathetic nervous system. An increase in sympathetic activity increases the heart rate and increase in parasympathetic activity decreases the heart rate. Alcohol affects the
Review of Literature

parasympathetic nervous system (Murata et al., 1994, Irwin et al., 2006) by depressing SA node and AV excitability. Samonma and Hakumaki, 1982 have reported the effect of alcohol on the vagus nerve.

Measurement of heart rate variability provides a promising approach for evaluation of the autonomic nervous function. Hence we decided to study the effect of alcohol on heart rate and heart rate variability using simple Cardiat 108 T, BPL Limited. The reliability and validity of this on measurement of heart rate variability has been reported by Suchitra et al., 2007. Though many software programmes have been developed, many Medical Institutes in India are unable to invest in such programmes. There is also lack of trained expertise to continually maintain such programmes.

HRV is a simple method to quantify cardiovascular autonomic neural input, in normal subjects and in patients with myocardial infarction, obesity, and cardiac failure. Reduced HRV in turn has been associated with increased mortality as reported by Stein et al., 1999 (Stein and Kluger, 1999). This probably would be due to parasympathetic disturbances occurring due to alcohol consumption. HRV using a standard 12 lead ECG recording may thus be a simple method to quantify cardiovascular autonomic neural input, in normal subjects and in patients with Myocardial Infarction, Obesity, and Cardiac Failure (Malik, 2008, Jiri et al., 2002).

2.14 d. AUTONOMIC PARAMETERS IN ALCOHOLICS

Autonomic parameters in alcoholics have been studied and reported by many authors. Atypical autonomic regulation in perpetrators of violent domestic abuse (Umhau et al., 2002), Autonomic neuropathy in patients with hepatic cirrhosis, (Bajaj et al., 2003); Stress response dampening indexed by cortisol in subjects at risk for alcoholism (Croissant and Olbrich, 2004), Erectile dysfunction as a sentinel symptom of cardiovascular autonomic neuropathy in heavy drinkers (Ravaglia et al., 2004); Parameters of the functional and morphological status of the upper digestive tract in alcohol-dependent male patients with depression and alexithymia in the context of autonomic nervous system activity (Swiatkowski et al., 2004); Sleep deprivation potentiates activation of cardiovascular and catecholamine responses in abstinent alcoholics (Irwin and Ziegler, 2005), Is there a relationship between somatic and autonomic neuropathies in chronic alcoholics (Nicolosi et al., 2005); Rapid adaptation of pancreatic exocrine function to short-term alcohol feeding in rats. (Deng...
et al., 2005), Effects on rat sympathoadrenal activity during "abstinence" (Rasmussen et al., 2006), Association between nocturnal vagal tone and sleep depth, sleep quality, and fatigue in alcohol dependence (Irwin et al., 2006; Alcohol use, urinary cortisol, and heart rate variability in apparently healthy men: Evidence for impaired inhibitory control of the HPA axis in heavy drinkers (Thayer et al., 2006), The effect of naltrexone and acamprosate on cue-induced craving, autonomic nervous system and neuroendocrine reactions to alcohol-related cues in alcoholics (Ooteman et al., 2007); SSR abnormalities in chronic alcoholics (Nazhel et al., 2007); Autonomic activation associated with ethanol self-administration in adult female rats (Bell et al., 2008); Illicit alcohol consumption and neuropathy – a preliminary study in Sri Lanka (Ferdinandis and De Silva, 2008); Correlation between the SERT binding densities in hypothalamus and amygdala in Cloninger type 1 and 2 alcoholics (Storvik et al., 2008); Ethanol acutely stimulates islet blood flow, amplifies insulin secretion, and induces hypoglycemia via nitric oxide and vagally mediated mechanisms (Huang and Sjoholm, 2008), Rats in acute withdrawal from ethanol exhibit left ventricular systolic dysfunction and cardiac sympathovagal balance shift (Liu et al., 2009).

Ralf Demmel et al., 2000 has done pupulometric studies, noise-induced stress and autonomic reactivity in male alcoholics. Neuropathic studies by Barter and Tanner, 1987 have reported altered BP recordings. Mortality in alcoholics with autonomic neuropathy has been worked on by Johnson and Robinson, 1988. Agelink et al., 1998 has reported on improved autonomic neurocardial balance in short term abstinent alcoholics treated with acamprosate.

Autonomic dysfunction in long standing group of alcoholics has been reported by Esko Matikainen et al. (1986) Hirsch et al. (1993) has reported recovery of reparatory sinus arrhythmia in detoxified alcoholic subjects. Autonomic neuropathy has been reported by various authors (Roser Monforte et al., 1985; Tan et al., 1985, Low et al., 1985; Jaume Villalta, 1989, Thuluvath and Triger, 1989). Tan et al., 1985 have reported that recovery of alcoholic vagal neuropathy is possible following prolonged abstinence in alcoholics Frank Schneider et al., 2001 have worked on the subcortical correlates of craving in recently abstinent alcoholic patients using olfactory stimuli.

The effects of illicit alcohol consumption in Srilanaka (Ferdinandis and De Silva, 2008), autonomic dysfunctions in schizophrenia (Karl-Jurgen Bär et al., 2009), small fiber neuropathy (Singer et al., 2004), Role of epsilon in painful alcoholic
neuropathy (Olayinka et al., 2000), hyperactive responses in children of alcoholics (Socorro Rodriguez Holguín, 1998), cerebellar shrinkage in ethanol toxicity (Nicolás and Fernández-Solà, 2000) are some of the studies available on conducting literature search on alcoholics and autonomic nervous system dysfunctions.

2.14e GSR AND CPT IN ALCOHOLICS

Alcohol consumption in young and old is a social hazard leading to many health problems. Autonomic nervous system is now known to alter in alcoholics and GSR is a method to measure the sympathetic activity in alcoholics and quantify stress by GSR. GSR is referred to variously as electro dermal activity, electro dermal response and skin resistance response. By virtue of the Galvanic Skin Response, autonomic nervous system activity causes a change in the skin's conductivity. GSR is a measure of stress in an individual. Psychological stress exists in alcoholics (Tempier et al., 2006) and so an alteration in GSR value was predicted in our study.

Previous study conducted in alcoholics on GSR have revealed that habituation retention disturbances occurring in chronic alcoholics depended on the patients' age, type of alcoholism, alcohol consumption intensity and chronicity, as well as the type of resting Electro encephalogram /EEG (Rogozea and Florea-Ciocoiu, 1989). A significantly lower resistance to extinction of the orienting reaction in alcoholics than in normal subjects has been reported (Rogozea and Florea-Ciocoiu, 1988; Agner and Serup, 1989; Nemstov, 1989). Addiction to alcohol or nicotine involves altered functioning of the brain's motivational systems. Altered functioning of the hypothalamic-pituitary-adrenocortical (HPA) axis may hold clues to the nature of the motivational changes accompanying addiction and vulnerability to addiction (Lovallo, 2006). The GSR conditioning in alcoholics has been studied by Vogel (1960 and 1961).

GSR estimation could thus provide valuable data on the extent and magnitude of changes occurring in the chronic alcoholics. As GSR reflects the sympathetic nervous system damage, this study is very significant in evaluating the activity of sympathetic nervous system. The pre and post counseling counseling/yoga values could prove useful in planning long time counseling and yoga activities to encourage them to go into recovery and if possible a complete remission. Hence GSR would...
help in the assessment of GSR in the present investigation using GSR before and after yoga and counseling.

Application of GSR and measurement of stress in many clinical conditions is presently restricted. By estimating GSR values and quantifying stress, we would be able to monitor the skin response before and after Harvard’s test in chronic alcoholics. Moreover, the condition of the heart, a very vital organ, at times of stress in chronic alcoholics is unavailable. Evaluation of GSR thus would disclose the degree/grade of damage to the sympathetic nervous system. It would also reveal the sympathetic status before the exercise and whether or not the patient can go ahead with the exercise testing. The alcoholic can also self regulate his health and stress by knowing his GSR values.

No reports are available on the GSR value in alcoholics before and after Harvard’s step test. Since Harvard’s step test measures the cardiac efficiency, GSR estimation before and after is a novel way to test the efficiency of the autonomic nervous system before and after the cardiac efficiency test. A comparison of these values with normal subjects would highlight the changes occurring in the alcoholic subjects.

Hence the objective of the present investigation is to estimate the GSR in alcoholics before and after Harvard’s step test and to estimate the GSR in normal subjects before and after Harvard’s step test.

It is hypothesized that the GSR value will be reduced in alcoholic subjects as the autonomic disturbances (Sympathetic nervous system) would cause alteration in skin conductance and resistance in them.

The cold pressor test/task (CPT) is a coldwater immersion task that has been used in a number of studies to test sympathetic nervous and HPA activity (Brady et al., 2006, Jian et al., 2002). Chronic alcohol consumption is also associated with abnormalities in HPA axis function. Increased ACTH or cortisol secretion is typically seen during acute alcohol withdrawal. This study was taken as an extension of measurement of sympathetic activity in chronic alcoholics.

**Rationale for doing CPT:** Since chronic alcoholics are known to have autonomic disturbances, this study sought to address the gap in the research literature concerning CPT and alcohol dependence by investigating the response to a classic physical test.
task The subjective stress response to a cold-water immersion task, the cold pressor task (CPT) was to be studied in men with alcohol dependence and a control group

2.15 REACTION TIME IN ALCOHOLICS

Though reaction time has been estimated in alcoholics, its usefulness in demonstration to patients for counseling purpose has not been worked on so far.

**Reaction time (RT)** is the elapsed time between the presentation of a sensory stimulus and the subsequent behavioral response.

**Reaction time and Counseling** can be defined as a relatively short-term, interpersonal, theory-based process of helping persons who are fundamentally psychologically healthy to resolve developmental and situational issues.

Alcoholism is defined as "a primary, chronic disease characterized by impaired control over drinking, preoccupation with the drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking.

Counseling plays an important role in helping the alcoholics to understand their addictive illness. The heart of any effective counseling process is a relationship characterized by warmth, genuineness, acceptance, caring and trust. This quality of relatedness is described in psychological language as "therapeutic".

Incorporation of a "physical component" in psychological counseling could probably help the alcoholics to understand the harmful effects of alcohol and this could have a significant positive impact in giving up his drinking habits. This could be used as basic channel of the helping process in "counseling techniques" and bring about constructive changes in chronic alcoholics. Successful merging of a simple physiological technique with psychological skill in counseling techniques could be a potent factor in enhancing the healing-growth process.

Alcohol has a biphasic effect on the body, as its effects change over time (Merideth et al., 2007). Initially, alcohol generally produces feelings of relaxation and cheerfulness, but further consumption can lead to blurred vision and coordination problems. The motor inabilities are exhibited as ataxia. Measurement of visual and auditory reaction time has been used to evaluate the processing speed of the central nervous system and co-ordination between sensory and motor systems.

Literature review has revealed that alcoholism notably persists because alcoholic subjects are not aware of their drinking habits consequences. People in pre-alcoholic phase may be able to correct their drinking behavior more readily if they
become aware of their progression towards destructive alcohol usage patterns (Sidney, 1983). Rotgers reported that most people who receive these interventions are not even aware that their drinking is harmful, so they are not highly motivated to change before the conversation with their health care provider (Available from: http://www.ciah.org/hbns/get Document cfm?documentID=1486). Maia Szalavitz has reported that Brief Physician Interventions Have Impact on Problem Drinking (Available from: http://www.ciah.org/hbns/get Document cfm?documentID=1486)

However, interventions to change alcohol behavior may be applied inappropriately if a patient's motivation to change is not factored (Antelo et al, 2008) meaning it is the motivation which needs to be enhanced primarily before any drug intervention is tried.

The first step in treating the alcoholic is the detoxification stage and the alcoholic must really truly want to quit drinking or else detoxification will not lead to continued abstinence. The biggest hurdle to overcome is for an alcoholic to accept that they have a drinking problem. Overcoming denial and enabling is often the first step to successful recovery for the alcoholic. Treatment only works if the alcoholic is ready. Forcing a treatment program on an alcoholic will be doomed to failure. If an alcoholic is going to get anything positive out of an alcohol treatment program, they must be willing and receptive. Many of the alcoholics in India are not educated and hence as lay-person with no medical background are not aware of the consequences of drinking habits. Based on this proposition there is justification of our assumptions.

The concept of readiness to change problem behaviors emerged from Prochaska and DiClemente's transtheoretical “stages of change” model (Prochaska et al., 1992) and has been widely applied in the context of substance use. Briefly, the model conceptualizes readiness to change as a series of stages through which the individual passes on the road to positive change. These stages include precontemplation, in which the individual has little or no awareness of the problem behavior and does not intend to change, contemplation, in which the behavior is acknowledged but there is still no commitment to change, and action, characterized by recent initiation of behavior change. During the precontemplation stage, people are not aware of their problematic behaviors and have no intention to change. Resistance to recognize problematic behavior is the hallmark of precontemplators. Studies indicated that 50% to 60% of smokers, drinkers, and overeaters were in the precontemplation stage of change (Abrams et al 1988, Gottlieb et al , 1990).
Motivational interventions have been developed to increase readiness to change substance use behaviors (Miller, 1983; Miller et al., 1991). Contacts with the health care system for both routine and acute care events provide important opportunities to implement these interventions. For example, primary care-based interventions have reduced alcohol consumption levels among patients who screen positive for problem drinking (Reiff-Hekking et al., 1990; Anderson and Scott, 1992; Israel et al., 1996; Fleming et al., 2002) and emergency department interventions with patients screening positive for blood alcohol or problem drinking have been effective in reducing alcohol intake and its negative effects (Gentilello et al., 1990; Bernstein et al., 1997, Wright et al., 1998, Longabaugh et al., 2001; D’ Onofrio et al., 2002). With regard to illicit drug use, Bernstein and colleagues have shown that heroin and cocaine use can be reduced by brief interventions in both primary care settings (Bernstein et al., 2005). Thus the importance of intervention by demonstration of reaction time to subjects was proposed to be studied.

The sensory and motor symptoms and signs extend proximally and progressively in chronic alcoholics (D’Amour and Butterworth, 1994). Fine and gross motor dysfunction in chronic alcoholic patients is prevalent, but not extensively studied (Parks et al., 2003). Similarly the motor and sensory deficits associated with chronic alcoholism have been reported by other authors (Vernan et al., 1993; Sullivan et al., 2000). If these sensory and motor disturbances can be directly shown to the patients, we hypothesized that it may improve their usefulness in counseling.

Studies have shown that a considerable recovery of cognitive functioning occurs, most dramatically after drinking cessation and more slowly thereafter revealing the importance of counseling and motivation to alcoholics (Goldman, 1983). Earlier studies indicate that alcoholics have alteration in reaction time (Fein and Chang, 2006, Hilderbrandt et al., 2006).

Though previous reports are available on the effect of alcohol intake on reaction time, the novel part of our study would deal with the effects of demonstration of reaction time impairment to chronic alcoholics and study the impact of this demonstration on counseling sessions. This study would address the crucial question concerning alcoholism, namely the development of new propositions to improve the current methods of treatment and to reduce the relapse rate.

Ando et al. (2008) has reported on the effects of acute alcohol consumption on neuromotor functions, Maurage et al. (2008) has reported that alcoholism leads to
early perceptive alterations independent of the co morbid depressed state and Noel et al (2007) has reported that the alcohol cues increase the cognitive impulsivity in individuals with alcoholism

2.16 C- REACTIVE PROTEIN

The correlation between cardiac efficiency and CRP was chosen as indicator of cardiac inefficiency and inflammatory markers and the make the study integrated. CRP was hence selected as an indicator of cardiac dysfunction in chronic alcoholics.

**hs- C-reactive protein (CRP)** is a protein produced as part of the inflammatory process. CRP is a plasma protein, an acute phase protein produced by the liver and by adipocytes.

CRP analysis is a test which measures the concentration in blood serum of a special type of protein produced in the liver that is present during episodes of acute inflammation or infection. Recently, new studies have suggested that CRP may also be elevated in heart attacks (Zairis et al., 2004) Many consider elevated CRP to be a positive risk factor for coronary artery disease (Gaziano et al, 1993)

Many studies suggested that after adjusting for other prognostic factors, hs-CRP was still useful as a risk predictor for recurrent cardiovascular disease, unstable angina and acute myocardial infarction (Klatsky et al., 1990, Rimm et al., 1991, Maclure, 1993) Higher hs-CRP levels also are associated with lower survival rate of these people Furthermore, population-based studies have shown that markers of inflammation such as hs-CRP predict future cardiovascular disease risks (Ridker et al., 1997, 2000, Koenig et al, 1999; Danesh et al, 2000).

Chronic alcoholics are known to be associated with inflammation of organs like heart, liver and pancreas. CRP level estimation could thus give us an idea of the exact inflammatory state in the alcoholics (Oruc et al, 2004).Gheorghiu et al, 2004 have reported significant immunologic changes appear before clinical or paraclinical signs of hepatic failure start in chronic alcoholics. More complex relationship among advanced glycation, oxidative stress and metabolism of ethanol and their link to nutrition and nutrition-associated parameters has been reported by Kalousova et al., 2004.

Related work on CRP in alcoholics have been reported by many authors. Acute pancreatic injury in asymptomatic individual after heavy drinking (Jaakkola et al, 1994); Ono et al., 1996; Prognostic factors in severe alcoholic liver injury
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(Fujimoto et al., 1999), Suppression of interleukin-6 to interleukin-10 ratio in chronic alcoholics (Sander et al., 2002), Low serum leptin levels and malnutrition in chronic alcohol misusers (Santolana et al., 2003) The C reactive protein as an inflammatory marker has been taken up along with interleukin studies in chronic alcoholics by the above authors

2.17 ANEMIA

Microcytic anemia:

Several articles have reported the effects of microcytic and macrocytic anemia on general health (Guyatt et al., 1990, Seward et al., 1990; Rockey and Cello, 1993, Kis and Carnes, 1998; Thomas and Thomas, 2002, Rimon et al., 2005, Murray and Beard, 2007)

Savage and Lindenbaum, (1986) have reported on anemia in acute and chronic alcoholics They have investigated trephine biopsies from 118 alcoholic patients in order to establish whether or not the known alcohol-induced alterations seen in smears are seen in bone marrow tissue sections, and whether new features might emerge, which could be suitable for defining the histological picture of a condition to be known as 'alcoholic dyshaematopoiesis' The main changes involved erythropoiesis and iron metabolism They can be attributed in part to destabilization of the red cell membrane. They have concluded that while these alterations are clearly visible in tissue sections, aspiration smears are needed to detect other features, especially ring sideroblasts.

Megaloblastic anemia:

Folic acid deficiency is also common in tropical areas where poverty results in a poor diet. In North America and other regions of the world where access to food is rarely a problem, folic acid deficiency still occurs because dietary needs are not met, especially during the growth of children and adolescents and during pregnancy. These age groups are more prone to folic acid deficiency anemia because of their heavy use of folate-deficient cow's milk, which also inhibits the absorption of iron, causing an additional risk of iron-deficiency anemia as well.
Causes of folic acid deficiency anemia include:

Alcohol abuse (alcohol prevents absorption of several nutrients especially the B vitamins), poor diets (common in alcoholics, the elderly, those living alone or in poverty, and infants, especially those with infections or diarrhea), impaired absorption because of intestinal dysfunction from such disorders as celiac disease, tropical sprue, regional jejunitis, Crohn's disease, or bowel resection, bacteria competing for available folic acid, over cooking of food, destroying valuable water-soluble nutrients, including a high percentage of folic acid, limited storage capacity in infants, prolonged drug therapy, especially from anticonvulsants and estrogens, not addressing increased folic acid needs of certain age groups, as well as in patients with neoplastic diseases and some skin disorders (Eg. chronic exfoliative dermatitis) Signs and symptoms of folic acid deficiency anemia gradually produces clinical features similar to other megaloblastic anemia's, but without neurologic manifestations of B12 deficiency. Symptoms include the following: progressive fatigue, shortness of breath, heart palpitations, weakness, glossitis (inflammation of the tongue), nausea, anorexia, headache, fainting, irritability, forgetfulness, pallor, slight jaundice (Balt, 2000, Dhar et al., 2003)

Vitamin B12 In individuals following omnivorous diets, dietary vitamin B12 is usually adequate However, elderly persons often have poorer B12 absorption due to atrophic gastritis and hypochlorhydria These individuals may be able to prevent B12 deficiency by taking low-dose crystalline B12 supplements However, if intrinsic factor deficiency is present, intramuscular injections or high-dose supplements (1 mg/day) will suffice to prevent or treat pernicious anemia (Baik et al., 1994) Persons who have had gastric bypass surgery are at risk for B12 deficiency, (Grange et al., 1994; Drummond et al., 1985) as are individuals who have followed vegan diets for many years without taking B12 supplements and their exclusively breast-fed infants. In these groups, the risk for vitamin B12 deficiency is easily eliminated with supplementation (Grange et al., 1994) Individuals who abuse alcohol and those with celiac disease are also at higher risk for deficiency (Quigley et al, 1986, Dahele and Ghosh, 2001).

Folate Due to fortification of grain products with folic acid, anemia resulting from folate deficiency is becoming less frequent. However, alcoholism often leads to poor folate intake and, combined with alcohol’s anti-folate effect, may lead to deficiency (Lindenbaum and Roman, 1980) An autosomal–recessive inborn error of
metabolism causes thiamine-responsive megaloblastic anemia (also known as Rogers Syndrome) (Singleton, Martin, 2001) Pharmacologic doses of thiamine (25–200 mg/day) correct the hematologic abnormalities associated with this condition (Bappal et al, 2001) Caution is necessary in prescribing folate supplements. As noted above, folic acid can mask signs of vitamin B₁₂ deficiency A psychiatric referral, along with substance abuse counseling and Alcoholics meetings or other community-based support, may be necessary. Vitamin B₁₂ supplementation, intramuscular or oral as indicated Megaloblastic anemia is typically caused by a vitamin B₁₂ or folate deficiency and can be easily treated Appropriate supplementation, increased consumption of folate–rich foods, and reduction of alcohol use can help prevent recurrence. In vegan diets, oral Vitamin B₁₂ supplementation is necessary If the primary cause of deficiency is alcohol use, the patient will likely need multilevel support facilitated through the primary care provider.

**Anemia in alcoholics:**

Anemia, is from the Greek word (Ἀναιμία) (an-haimia) meaning "without blood," is defined as a qualitative or quantitative deficiency of hemoglobin, a molecule found inside red blood cells (RBC's)

Alcohol has been widely consumed through the ages because of its perceived benefits as a social lubricant and for relaxation, mood alteration, and sensory pleasure. It can cause gastritis, indigestion, peptic ulcer and B₁₂ deficiency. Prolonged daily excessive alcohol consumption has an influence on many systems. Long-term consumption of large amounts is harmful, leading to addiction and fatal or nonfatal injuries. It can cause cirrhosis of the liver, pancreatitis, gastritis; hypertension, cardomyopathy; dysrhythmia, hemorrhagic stroke; degenerative nervous system conditions, cancers of the mouth, pharynx, larynx, esophagus, and liver; and fetal damage (Klatsky et al., 1992)

Chronic alcoholism has been regarded as a psychosomatic disease with both psychological and physiological determinants. Chronic alcoholism is a disease of multiple etiologies, the agent alcohol being one of the causes. Other causes are related to malnutrition, metabolism and genetic endowment of the host which may be more critical in the pathogenesis of alcoholism than the agent.

Alcoholism can cause defect in iron metabolism and folate metabolism. Edward Eichner, 1973 has reported the hematological abnormalities in alcoholics
Reports are available which have associated iron deficiency and microcytic anemia in chronic alcoholics (George et al., 2004) Macrocytic anemia has been reported by some authors (Colle and Ceschia, 1992) Significant malnutrition has been recorded in alcoholics (Elaine, 1973) Thus the etiology of anemia in alcoholics is complex and often multifactorial, causes include a combination of poor nutrition, chronic inflammation, blood loss, liver dysfunction and ineffective erythropoiesis (Colman and Herbet, 1980; Gemma et al., 2007)

The accurate assessment of anemia in alcoholics requires identification of the relative contributions of the direct toxic effects of alcohol and poor nutrition on the synthesis, function and survival of red blood cells, and of the role of underlying chronic disease such as cirrhosis or chronic sepsis. The presence or absence of chronic liver disease can be obvious from the patient's medical history and examination, but a liver biopsy sample is often useful for typing and staging of disease.

Alcohol can be directly toxic to the bone marrow, as revealed by pre-erythroblast vacuolation or sideroblastic changes Alcoholism and the debilitating factors with which it is often associated (e.g. chronic sepsis and poor nutrition) frequently causes marked anemia even if liver disease is absent (e.g. sideroblastic anemia, megaloblastic anemia and the anemia of chronic inflammation). Thus, a proportion of alcoholics have both reduced erythrocyte production in the bone marrow and accompanying reduced red blood cell survival time (Eichner and Hillman, 1971, Savage and Lindenbaum, 1986)

Excessive alcohol consumption overloads the liver adversely affecting its ability to store fat soluble vitamins (Vitamin A, D, E) and metabolize protein. In addition alcoholics have lower levels of calcium, folate, magnesium, thiamin (B1), riboflavin (B2), niacin (B3) and zinc Vitamin-containing co enzymes are involved in the oxidation of alcohol in the body, so vitamin deficiency may impair the rate of alcohol oxidation, increasing the retention of alcohol in the blood of malnourished alcoholics. So there is often complex mechanism of anemia in alcoholics (Babasahab Desai, 2000).

Contradictory reports are available about the prevalence of anemia in alcoholics. Some reports state that microcytic hypochromic anemia (Schmitt et al., 1999) is present while some reports state that macrocytic anemia (Fernando, 1998, Hashizume, 1997) is more prevalent in alcoholics

Hematological abnormalities in early abstinent alcoholics are closely associated with alterations in thrombopoietin and erythropoietin serum profiles (Schmitt et al., 1999).

2.18 COUNSELING

Autonomic parameters and counseling and HRV

No directly related article was found on search of HRV parameters and counseling. Only indirect articles which were found on search lines.

Only related articles on heart rate variability and counseling were found in diabetic patients. Diabetic autonomic neuropathy can cause heart disease, gastrointestinal symptoms, genitourinary disorders, and metabolic disease. Strict glycemic control can slow the onset of diabetic autonomic neuropathy and sometimes reverse it. Pharmacologic and nonpharmacologic therapies are available to treat symptoms (Vink and Erbas, 2001).

The importance of counseling in heart-brain medicine (Michael, 2008, Eric et al., 2004) and in male sexual functions, Fouad, (2001) has been reported.

Physical fitness alcoholics and counseling

The rationale, programme of aerobic exercise for alcohol recovery has been reported by Richard Brown et al (2009). Studies on physical activity in alcoholics have been conducted and reported by Georita frierson et al. (2008). A leisure counseling model for alcoholics has been reported by Quinn, 1992. Caterina Grassi et al. (2009) have worked on combined counseling and bupropion therapy in detoxified alcoholics. Studies by Patricia Elmer et al. (2006) have shown alteration in Physical Fitness, cardio respiratory fitness in alcoholics undergoing counseling. Related work...
on cardio-respiratory fitness as a Predictor of stroke has been reported by Steven et al. (2008).

Participants recorded physical activity and answered questionnaire in a study conducted by a collaborative work group working on modification of blood pressure control. A post-discharge study on the physical regime of male alcoholics has been reported by Milan, 1970 has stated that a good nutrition can reduce the cardio vascular disease status. Good nutrition and regular physical activity can reduce the cardio vascular disease as reported by studies conducted by Louis et al. (2007).

Reaction time and counseling:

Alcoholic inpatients undergoing treatment based on the 12-step treatment of Alcoholics Anonymous (Minnesota model), which includes counseling, and intensive group, individual, and family psychotherapy, show an avoidance for drug-related stimuli and a perception of loss of control over drinking. Townshend and Dukka, (2007) have suggested that their increased perception of loss of control over drinking produces the avoidance from the drug-related stimuli.

2.19 JUSTIFICATION OF THE STUDY

Why the work was chosen As Alcoholism is an age old problem and it has vast scope. The alcoholics may be acute or chronic drinkers. The chronic drinkers manifest many symptoms and many of the patients want to quit drinking. In our study we wanted to demonstrate some of the harmful effects of chronic alcoholism and look at the usefulness of counseling and yoga on these parameters. Since cardiovascular parameters include those dealing with heart (cardiac efficiency) and the vascular system (anemia), these were chosen. Physical fitness closely affects the heart and blood parameters. Some inflammatory markers like C reactive protein are altered in cardiac inefficiency. The changes in various imperative physiological parameters before and after counseling will enable the counselors to be aware of the parameters which can be improved.

And the parameters which cannot be altered due to long standing damage can be worked on in such a way to prevent further progression and evolution of the disease and restore the patient’s health to the maximum possible. Though this may not provide a miracle and normalcy in chronic alcoholics, this could enhance the
longevity of the chronic alcoholics by diligent support from the rehabilitation ward and the family

The good news is that most alcoholics with cognitive impairment show at least some improvement in brain structure and functioning within a year of abstinence, though some people take much longer (Gansler et al., 2000; Sullivan et al., 2000, Bates et al., 2002) Clinicians must consider a variety of treatment methods to help people stop drinking and to recover from alcohol-related brain impairments, and tailor these treatments to the individual patient.

Hayashida et al. (1988) have discussed on the justification of medical alcohol detoxification in a randomized, controlled study. The findings of this study revealed relatively few short-term outcome differences for patients meeting study criteria who were randomly assigned to either outpatient or inpatient medical detoxification. Given the higher costs of inpatient treatment, these findings suggest that outpatient detoxification can be considered as a meaningful and cost-effective treatment for persons with mild to moderate alcohol withdrawal symptomatology.

The main concern of our study involved the status of the patients after counseling and yoga. If any physiological parameters can be altered by yoga and counseling, then the alcoholics can be effectively educated on their fair chances which are prevailing for regaining their health and to make sincere attempts on abstinence, continued yoga, counseling therapy and regular visits to counseling centers as follow up, so that they can follow the best possible healthy, productive and respectable life. Though a short term effect of yoga and counseling can be demonstrated, a long term effect of healthy practices like yoga, counseling will help the chronic alcoholics on the road to recovery.

2.20 OBJECTIVES AND WORK PLAN

Based on the controversial reports on alcohol on the cardiovascular system and anemia, absence of references on physical fitness, C-reactive protein in chronic alcoholic, and very little information available on the effects of chronic alcoholism on sympathetic and parasympathetic systems, measurement of reaction time and effectiveness of demonstration of reaction time in counseling and possible reduction in relapse rate, effects of an alcoholic parent on the anxiety scores/levels in COA (children of alcoholics) this study was taken up to understand and appreciate the manifold effects of alcohol on the systems of the human body. The physiological
parameters chosen would be repeated after counseling and yoga in order to determine and observe the changes occurring there after.

The main objective of this study was to assess the impact of chronic alcoholics on selected physiological parameters (general health, certain autonomic parameters and hematological parameters) and seeing the effect of counseling and yoga on these parameters without any medication. The groups of patients taking medication were not selected because the effect of medication like sedatives and anti craving drugs would 1. Make it difficult to conduct the experiments and do the recording procedures) and also 2 The effect of the drugs would cause variations on the parameters

For this purpose we have carried out the research work before and after counseling and yoga in the following lines:

WORK PLAN:
1. To look for pre and post counseling/yoga changes in the following physiological parameters.
2. To look for correlation between these parameters.

General Health:
❖ Impact of chronic alcoholism on physical fitness and cardiac efficiency.
❖ Consequence of chronic alcoholism on skeletal muscle strength and endurance.

Autonomic Parameters
❖ Comparison of heart rate variability (HRV) in normal subjects and chronic alcoholics.
❖ Quantification of stress in chronic alcoholics using galvanic skin response (GSR).
❖ Relation between GSR and HRV

Physiological (including Hematological and biochemical parameters)
❖ Demonstration of reaction time in usefulness for counseling.
❖ Estimation of C-reactive protein in the serum of chronic alcoholics.
❖ Existing type of anemia in chronic alcoholics

Additional work
❖ Determination of anxiety in children of alcoholics (these alcoholics are different from those in the main part of the study)
2.2.1 SIGNIFICANCE OF THE STUDY

Alcohol and its harmful effect on the subject and society are of significance as alcohol is consumed by the population as a whole. Addiction to alcohol is well known. The health hazards and accurate worsening of the health, physical condition and well being of the individual can be assessed, reviewed and evaluated.

Hence it is proposed that the action of alcohol will be studied in chronic alcoholics before and after alternate treatment like yoga (breathing exercise and counseling) on various parameters. The effects of alcohol on various organs or systems like heart, skeletal muscle, blood, C-reactive protein, physical fitness, autonomic nervous system, reaction time, skin resistance would be deliberated. A careful consideration of the detrimental and dangerous effects of alcohol on multiple organs in human body would help us to highlight the unfavorable and injurious side effects to the public. The possible risks and harmful actions would help in counseling the alcoholic subject and their families and thus enriching their life.

This research would thus have educational value to both the individual and society.