Review Article **Biochemistry**

International Journal of Pharma and Bio Sciences

ISSN 0975-6299

AN ALTERNATE DIET APPROACH TO QUITTING ALCOHOLISM

A.ARUN, S.VIJAYALAKSHMI *, KANCHANA ARUN, AND CHITTARANJAN SRIVASTAVA

Assistant professor School of Catering and Hotel Management, Vels University, Chennai, India

ABSTRACT

Alcoholism is a chronic addiction. International disease classification ICD-10, alcoholism is listed among the types of “behavioural and mental disorders due to the use of mentally effected substance”. Drinking too much alcohol is the cause of physical illnesses and other severe long term psychiatric problems. As the addictive potential of alcohol is very high, the single possibility of treatment to give up alcoholism is by consuming foods or taking medicines. The nutrition and diet component are rarely addressed and most people are unaware of their extreme significance or that an alternative alcoholism treatment even exists. Highlighting this objective, the simple dietary modification which includes eating fiber-rich complex carbohydrates, dopamine-enhancing foods and L-glutamine-containing foods which help to keep cravings under control have been addressed. Also the reviews are centred of eating a diet rich in fresh fruits and vegetables helps to replace essential vitamins that the body loses through malabsorption when drinking alcohol and thus helping to prevent vitamin deficiencies. In this article an alternate diet approach with unwanted side effects are highlighted.

KEYWORDS: **Alcoholism, Quitting, Alternate diet, Dopamine, L- Glutamine**

S.VIJAYALAKSHMI
Assistant professor School of Catering and Hotel Management, Vels University, Chennai, India

INTRODUCTION

Alcohol use disorders refer to excessive drinking behaviours that can create dangerous conditions for an individual and others. The two major types of alcohol use disorders are alcohol abuse (problem drinking) and alcohol dependence alcoholism .[1]Alcoholism is also known as a family disease. An alcoholic can totally disrupt family life and cause harmful effects that can last a lifetime.[2]Alcoholism and alcohol abuse are evidently related to mental and emotional diseases. Even though alcohol is in such general use worldwide, the regular consumption of alcoholic beverages is a serious health hazard and definitely a nutritional problem and alcohol abuse can lead to addiction, emotional problems, and a number of specific degenerative processes. Overall, alcohol is a toxic irritant for the human being.[3]There are over 100 million regular drinkers in the United States alone and an estimated 10 million alcoholics. More than half of the population (some estimates are that 80 percent of adults are social drinkers) use some alcohol, and more than three-fourths have tried it. Approximately one in ten drinkers has an alcohol problem. This is an even bigger concern in teenagers, who are not prepared to handle this depressant drug. More and more children are trying alcohol, and an estimated 15-20 percent of those 15-17 years old are regular drinkers.[4]Alcohol slows us down mentally and physically, as it hampers our reflexes and judgment. It is a sedative that lowers our function and coordination. WHO has estimated the global burden of disease due to alcohol using Alcohol Attributable Fractions (AAF) as described above, and found that alcohol accounts for 4% of all disease burden worldwide.[5] Alcohol is the third leading cause of disability in the developed world after smoking.[6]Alcohol is one of the leading causes of death and disability globally and in India.[7] Alcohol is attributed to nearly 3.2% of all deaths and results in a loss of 4% of total Disability Adjusted Life Years (58 million). It is acknowledged that countries which had low alcohol consumption levels are now witnessing an increasing consumption pattern.[8] The report stated that 38.3% of the global population consumed alcohol. On an average, an individual over 15 years of age consumed 6.2 liters of alcohol annually. Americans consumed 8.5 to 9.9 liters of alcohol per annum while the Canadians consumed a whopping 12.5 liters per annum. The report also states that in 2012, about 3.3 million deaths, or 5.9% of all global deaths, were attributable to alcohol consumption. In India, it was revealed that over 11% of the population indulged in heavy or binge drinking. The global stood out 16 %. On the 'Years of Life Last' scale, which is based on alcohol- attributable years of life lost, India has been rated 4 on a scale of 1 to 5. This implies that the alcohol consuming population of India loses most years of their life because of drinking and its consequences. Alcohol consumption also contributes to about 10 percent of the disease burden due to tuberculosis, epilepsy, hemorrhagic stroke and hypertensive heart disease in the world, the report added [9] and 20–30% of hospital admissions are due to alcohol-related problems. [10] Alcoholism is not a readily definable term. It usually refers to a person's habitual and excessive drinking of alcoholic beverages, involves their many unsuccessful attempts to stop, and describes their continued drinking despite adverse consequences to health, responsibilities, and personal values[11].

ALCOHOL'S EFFECTS ON BODY

According to WHO, alcohol is implicated as a risk factor in over 60 health disorders including high blood pressure, stroke, coronary heart disease, liver cirrhosis and various cancers.[11]Alcoholics are not all alike; they experience different subsets of symptoms, and the disease has different origins for different people. Therefore, to understand the effects of alcoholism, it is important to consider the influence of a wide range of variables. Alcohol interferes with the brain's communication pathways, and can affect the way the brain looks and works. These disruptions can change mood and behaviour, and make it harder to think clearly and move with coordination. The most plausible conclusion is that neurobehavioral deficits in some alcoholics result from the combination of prolonged ingestion of alcohol, which impairs the way the brain normally works, and individual vulnerability to some forms of brain damage.[12]Drinking alcohol a lot over a long time can damage the heart, causing problems including: cardiovascular disorders, cardiomyopathy, hypertension, coronary artery disease, and stroke.[13]The liver is particularly susceptible to alcohol-related injury because it is the primary site of alcohol metabolism. Heavy drinking takes a toll on the liver and liver inflammations including, fatty liver, alcoholic hepatitis, fibrosis, cirrhosis.[14] Pancreatitis is a potential fatal inflammation of the pancreas with long-term alcohol consumption. The research concludes that there was an association between alcohol and pancreatic cancer. [15] People who drink heavily are at even higher risks for certain cancers such as oral, esophageal, laryngeal, pharyngeal, breast, colon, rectum, liver and pancreatic cancers are common in alcohol users than in non-alcohol users.[16] Drinking too much in young, healthy adults significantly disrupts the immune system. Chronic drinkers are more liable to counteract diseases like pneumonia and tuberculosis.[17] People who believe that they might have an alcohol problem should definitely seek treatment and they can get off alcohol if they are willing to try by means of an alternate diet approach which is considered as the safest treatment. Keeping this view, in this article, the dietary modification recommended for alcohol consumers who are willing to quit alcoholism without producing unwanted side effects by means of diet therapy has been discussed. The primary objective of the study is to identify and evaluate the medical conditions of the drinkers and deficiencies of concern as a result of alcohol abuse. Secondly to review the appropriate diet recommended for those seeking recovery from alcohol withdrawal and to reduce craving for alcohol. This study explores on dietary modifications which include eating fiber rich complex carbohydrates, dopamine-enhancing foods and L-glutamine-containing foods. Dietary recommendations were studied which includes a diet rich in vitamins and minerals that the drinkers required to supplement that the body loses through malabsorption and thus helping to prevent vitamin deficiencies. Diet and vitamin therapy may be helpful during withdrawal, detoxification, and recovery from alcoholism. Alcoholics while drinking

generally need more supplements than most other people.

ALCOHOL WITHDRAWAL SYNDROME

Alcohol dependence is even more serious. People who are dependent on alcohol lack the ability to voluntarily stop drinking. They develop a physical tolerance, so that they require increasingly large amounts to become intoxicated. They also develop withdrawal symptoms, including rapid heartbeat, anxiety, and even seizures, when they drink less or stop drinking.[18]

SIGNIFICANCE OF NUTRITION AND DIET THERAPY FOR DRINKERS

Individualized nutrition counselling and comprehensive nutrition education programs provided to the substance abuse population have been found to significantly improve three-month sobriety success rates. Just as patients with diabetes or heart disease receive nutrition education to manage their diseases, patients dealing with substance abuse should have nutrition education that addresses their specific risk factors and increases their chances of recovery.[19]

DIET FOR ALCOHOL DETOXIFICATION

During the actual withdrawal period, the diet can be focused on fluids and the alkaline foods. The appetite is usually not great, and liquids will help in clearing alcohol from the body. Water, diluted fruit and vegetable juices, warm broths and soups, and teas using herbs, such as chamomile, skullcap (a nervine), or valerian root all will serve the needs. Some other herbs that may be helpful during withdrawal are white willow bark to reduce pain and inflammation, ginseng, cayenne, and peppermint. Small amounts of light proteins, such as non-fatty poultry, fish, or even chicken soup, will provide more nourishment. [4]Because of the multiple nutrient deficiencies associated with long-term substance abuse, many alcohol and drug users who quit require a high-potency multivitamin-mineral after detoxification.

NUTRITIONAL DEFICIENCIES

Alcohol consumption, particularly at heavy drinking levels, not only influences the drinker's diet but also affects the metabolism of those nutrients that are consumed. Thus, even if the drinker ingests sufficient proteins, fats, vitamins, and minerals, deficiencies may develop if those nutrients are not adequately absorbed from the gastrointestinal tract into the blood, are not broken down properly, and/or are not used effectively by the body's cells. Two classes of nutrients for which such problems occur are proteins and vitamins.[20] In addition to the poor intake of food nutrients common with alcohol abuse, alcohol impairs digestion and absorption of many nutrients from the small intestine. These include most B vitamins, such as B1, B6, B12, choline and folic acid, as well as some minerals; and with liver impairment absorption of the fat-soluble vitamins A, D, E, and K is also reduced. Alcohol's diuretic effect can lead to the loss of nutrients and create dehydration as well. Alcohol also uses nutrients that it does not provide for its own metabolism, impairs the metabolism of many others, and reduces liver stores of even more. For example, vitamins B1 and B3 are needed by the liver to metabolize alcohol, and these are often in short supply. Folic acid's function in the bone marrow, where it helps make red blood cells, is diminished by alcohol. Thus, anemia may develop more easily with alcohol abuse, especially with low levels of vitamin B12 and reduced absorption and storage of iron. The low vitamin D availability and poor calcium absorption can lead to an increased risk of osteoporosis. The loss of many minerals, such as zinc and magnesium, increases even more with caffeine use. The lack of appetite caused by alcohol abuse also makes it harder to get needed nutrients. In the elderly, where nutritional status is often unstable and alcohol consumption a problem, nutritional deficits can be exacerbated. Alcoholism in all ages is commonly associated with malnutrition. Other nutrients commonly deficient with alcohol abuse include vitamins B2, B6, A, and C, essential fatty acids, and methionine.[4]Malnutrition with folate deficiency is frequently found among alcoholics, and could be caused in part by decreased intestinal absorption. The research data suggest that the combination of dietary folate deficiency and prolonged ethanol intake results in intestinal malabsorption of several water-soluble substances, which may account in part for the poor nutrition often found in binge drinkers.[23]Vitamins are important for mental health include iron, folate, and vitamins B6 and B12. Deficiencies of any of these nutrients can mimic mental health problems such as depression, fatigue, poor attention, and altered sleep.[22]

NUTRITIONAL SUPPORT FOR DRINKERS

Alcohol abuse may lead to decrease appetite and keep the body from absorbing vital nutrients which result deficient in a number of vitamins and minerals. Supplements will help them to regain their health. Beneficial supplements may include vitamin B complex, vitamin C, selenium, magnesium, and zinc. Those who take in more than 30% of their total calories in alcohol generally have a significant decrease in their intake of all macronutrients and deficiencies in vitamin A, vitamin C, and thiamine.[23]Alcohol destroys the liver and brain gradually, but profoundly. This damage increases the need for nutrients to repair these organs at a time when the drinker is eating fewer good foods.[24] Vitamin C improves the metabolism of the toxic by-products of alcohol and, in large quantities, is a powerful antitoxin. It has also been shown to be effective against hepatitis.[25]

DIETARY RECOMMENDATION TO REDUCE CRAVING FOR ALCOHOLISM

Alcohol abuse is huge problem but there is way to curb alcohol cravings naturally, predominantly the diet which enhance dopamine secretion. L-Glutamine-containing

foods and also fiber-rich complex carbohydrates stop cravings for alcohol.

DOPAMINE-ENHANCING FOODS

According to The Medical News, dopamine is a monoamine neurotransmitter that is found in the different areas of brain and is essential for several functions of the central nervous system such as excitement, motor control and cognitive function.[26] Dopamine depletion can occur with alcohol withdrawal. According to The Encyclopaedia of Mental Disorders, repeated use of alcohol can impair dopamine levels in the brain. When a person is dependent on alcohol, brain areas that produce dopamine become depleted. Patients in this condition can no longer enjoy the pleasures of everyday life and will develop alcohol withdrawal syndrome.[27]According to Dr. Domenic Ciraulo of Boston Medical Center, alcohol causes a chemical imbalance in the brain involving the neurotransmitters dopamine and serotonin. While alcohol initially leads to an increase in dopamine, chronic alcohol consumption eventually causes dopamine levels to fall, leading to a more anxious craving for alcohol and requiring larger amounts of alcohol to get the same effect.[28] In order to reduce the withdrawals and cravings associated with the elimination of alcohol, it is important to maintain a properly functioning dopamine system. In general increasing dopamine is considered healthy and safe when this is supplemented through diet. Dopamine cannot be obtained directly from food, but tyrosine an essential amino acid and a dopamine precursor, is abundant in several protein-rich foods, which include- chicken, turkey, avocado, nuts and seeds.[29] By eating foods rich in tyrosine, the brain will be able to synthesize the neurotransmitter dopamine. Proteins are high in amino acids, which are necessary for dopamine production. Include foods such as fish, eggs, chicken, turkey and red meat to supply the body with adequate amino acids. Certain vegetables are excellent sources of amino acids that stimulate dopamine production which includes beets supply the amino acid called betalain that aids in the regulation neurotransmitters like dopamine. Artichokes and avocados have also been found to increase dopamine level. Ripe bananas, strawberries, blue berries and prunes are the best fruits supplying nutrients that trigger dopamine release. Raw almonds, sesame seeds and pumpkin seeds are excellent sources for the amino acids needed for dopamine production. Wheat germ supplies the essential amino acid phenylalanine that is converted to tyrosine which then stimulates additional dopamine release. Herbs include nettles, fenugreek, ginseng, milk thistle, red clover, and peppermint help to regulate dopamine levels. Adding supplements to the diet to increase dopamine levels like vitamins B, C and E as well as iron, folic acid and niacin all help to trigger dopamine release.[30]

VITAMIN- B AND VITAMIN- C TO ELIMINATE ALCOHOL CRAVING

Research suggests that alcoholic cravings are due to a deficiency in B vitamins and that supplements may lessen the desire to drink and also B compex vitamins can help restore normal liver function.[31] As reported by The Linus Pauling Institute at Oregon State University (OSU) and numerous studies have shown that vitamin C in high doses reduces oxidative stress as a result of alcohol consumption, and prevents alcohol-induced hyperlipidemia and lipid perodixation. The nutrient can also help eliminate alcohol addiction.[32]The best sources of vitamin B3 can be found in salmon, tuna, beetroot, beef kidneys and livers, and peanuts. Chicken, red meat, dairy products, and eggs all contain the amino acid tryptophan, which the body can convert into niacin. Nutrients that can help with vitamin B3 absorption are vitamins B1, B2, B6, B12, and C, along with chromium, zinc, potassium, manganese, chromium, phosphorus, copper, folic acid, iron, magnesium, selenium, and tryptophan.[33]

L-GLUTAMINE-CONTAINING FOODS

Part of kicking the alcohol habit involves eliminating alcohol cravings, which can be achieved through supplementation with the non-essential amino acid L-glutamine. L-glutamine decreases physiological cravings for alcohol, while also replacing what has been lost of the nutrients in the liver and kidneys as a result of alcohol abuse.[32] L-glutamine takes part in many biochemical processes and is found in enzymes and other body proteins. An important energy source for the brain in the form of L-glutamic acid and it also assists in the production of hydrochloric acid in the stomach. Also it reduces alcohol and sugar craving, therefore it is helpful to people giving up drinking. Significantly it may alleviate some mental disorders and drug dependence. Sample food sources (as glutamic acid) (in g per 100g) Wheatgerm (11.22), Cheddar cheese (6.00), almonds (5.62), sunflower seeds (5.35), sesame seeds (4.95), halibut (3.08), free-range poultry (3.00), lean beefsteak (2.84), soya beans (2.79), free-range eggs (1.93), low-fat yoghurt (0.71), corn (0.65), avocado (0.42), jacket potato (0.40), dried figs (0.30), dried peaches (0.24), peas (0.14).[34] According to the Breining Institute, L-glutamine decreases desire for sugar cravings and alcohol and is useful for recovering alcoholics. It improves sleep, decreases anxiety and reduces cravings.[35] The research study was done in 1957 in both animals and humans suggests that this amino acid can reduce both cravings and the anxiety that accompanies alcohol withdrawal.[36] It also enhances antioxidant protection. Many plant and animal substances contain glutamine, [37] but it is easily destroyed by cooking. If eaten raw, spinach and parsley are good sources.

LECITHIN

Recent studies suggest that a lecithin enriched diet can modify the cholesterol homeostasis and lipoprotein metabolism. Lecithin diet modifies the cholesterol homeostasis in the liver, increasing the activity of HMG-CoA reductase and cholesterol 7 alpha-hydroxylase, and decreasing the microsomal ACAT activity. One of the most spectacular properties of lecithin is its ability to

reduce the excess of LDL cholesterol. It also promotes the synthesis in the liver of great amount of HDL, the beneficial cholesterol. Bile acid secretion with high levels of cholesterol and phospholipids is encouraged by lecithin-rich diets when compared with diets without lecithin.[38-39]Lecithin (2 to 5 tablespoons daily) makes up one third of the brain by dry weight. Lecithin also provides choline, which the body can make into the neurotransmitter acetylcholine. As with L-Glutamine above, this produces a feeling of well being and self-control so wanting in most alcoholics. Soya bean lecithin is also a possibility because it can restore phosphatidyl choline levels and inhibit fibrosis in baboons that are fed alcohol.[40]

FIBER-RICH COMPLEX CARBOHYDRATES TO CURB ALCOHOLISM

A growing body of evidence indicates an association between preference for stronger sweet solutions and excessive alcohol intake, both in animals and in humans. Low blood sugar, or glucose levels, can induce a craving for alcohol. If the body is used to consuming excess alcohol, it may crave alcohol as a readily available form of fuel. Eating simple carbohydrates, such as sugar and processed foods, causes blood sugar levels to quickly rise, giving a sugar rush, then causing sugar levels to drop, which can induce craving. Instead, consuming fiber-rich complex carbohydrates, such as whole-grain breads and cereals, legumes and fresh fruits and vegetables, which digest more slowly, when the blood sugar level remains steady, helps keep cravings under control.[41]When heavy drinkers and alcoholics abstain, there is an increased desire or craving for alcohol probably because the dysphonic feelings are not relieved from alcohol consumption. To compensate, other substances such as coffee, candy, fruit juices and sweet drinks have been suggested as being used in the place of alcohol.[42]

CONCLUSION

To improve health and reduce alcohol cravings, including whole grains, fruit, and other healthful foods, and limiting sugar, caffeine, and junk food would be more beneficial. Appropriate diet approach of alcohol withdrawal can relieve the patient's discomfort and prevent the development of more serious symptoms. From this review article it is concluded that an alternate diet approach will help the patients with alcoholism to reverse malnutrition, prevent alcoholic related diseases, and reduce alcohol craving thereby establish a healthful lifestyle.

CONFLICTS OF INTEREST

All authors declare no conflict of interest.

REFERENCES

1. Hingson RW, Heeren T and Winter MR. Age at drinking onset and alcohol dependence: age at onset, duration, and severity. Arch Pediatr Adolesc Med. 2006;160(7):739-46
2. Dr. Christopher L. Heffner .Alcoholism and its Effect on the Family. [internet]. 2003 December 14 [cited 2016 March 15] Available from: http://allpsych.com/journal/alcoholism.
3. Demirbas H, Ilhan IO and Dogan YBI. Assesment of the mode of of anger expression in alcohol dependent male inpatients. Alcohol and Alcohol National Institutes of Health. Pub Med: 21606055. 2011; 46(5): 542-6
4. Elson M. Haas, MD. Detoxification Programs: Nutritional Program for Alcohol Detoxification. [interent] [cited; 2016 April 05] Available from: http://www.healthy.net/scr/article.aspx?Id=1851
5. Valdimir Poznyak and Dag Rekve (Ed). Global status report on alcohol and health. . World Health Organization. 2014:
6. Lisa Jones , Mark A Bellis. Updating England-Specific Alcohol- Attributable Fractions for England:Liverpool John Moores University: Center for Public Health. 2013
7. N Girish, R Kavita, and Vivek Benegal. Alcohol Use and Implications for Public Health: Patterns of Use in Four Communities. Indian J Community Med. 2010; 35(2): 238-244
8. Global status report on alcohol. Geneva: World Health Organization; 2004
9. A. Correspondent. Alcohol Consumption in India on the rice: WHO Report. [internet] 2014 May 15 [cited 2016 August 25] Available from: http://www.mid-day.com/articles/alcohol-consumption-in-india-on-the-rise-who-report/15299173
10. Benegal V, Gururaj G and Murthy P. Project report on a WHO multicentre collaborative project on establishing and monitoring alcohol's involvement in casualties, Bangalore: NIMHANS. 2000-01
11. International Guide for Monitoring Alcohol Consumption and Related Harm. Geneva: WHO; 2000
12. Marlene Oscar Berman and Ksenija Marinkovic. Alcoholism and the Brain: An overview. National Institute on Alcohol Abuse and Alcoholism. [internet] 2004 [cited 2016 May 16] Available from:http://pubs.niaaa.nih.gov/publications/arh27-2/125-133.html
13. Diane L. Lucas, Ricardo A. Brown, Momtaz Wassef and Thomas D. Giles. Alcohol and the Cardiovascular System: Research Challenges and Opportunities. Journal of the American College of Cardiology. 2005;45(12):1916-1924
14. Jacquelyn J., Maher, M.D. Exploring alcohol's effects on liver Function. Alcohol Health and Research World. 1997; 21(1)
15. Luiz Roberto Wendt, Alessandro Bersch Osvaldt, Vivian Pierre Bersch, Rita de Cássia Schumacher, Maria Isabel Albano Edelweiss and Luiz Rohde. Pancreatic intraepithelial neoplasia and ductal adenocarcinoma induced by DMBA in

mice. Effects of alcohol and caffeine. Acta Cir. Bras. 2007;22(3)
16. Alcohol Use and Cancer. American Cancer Society. [internet] Revised 2014 December 02 [cited 2016 February 22]. Alcohol and Cancer. Availble from: http://www.cancer.org/cancer/cancercauses/dietandphysicalactivity/alcohol-use-and-cancer
17. Samantha M. Simet, and Joseph H. Sisson. Alcohol's Effects on Lung Health and Immunity. Alcohol Research Current Reviews. The Journal of the National Institute on Alcohol Abuse and Alcoholism.] 2015:37(2) http://www.arcr.niaaa.nih.gov/arcr/arcr372/article05.htm
18. Andrew well, M.D. Alcoholism. [cited; 2016 March 31]. Available From; http://www.drweil.com/drw/u/ART03108/Alcoholism.html
19. Grant LP, Haughton B and Sachan DS. Nutrition education is positively associated with substance abuse treatment program outcomes. J Am Diet Assoc. 2004;104(4):604-610
20. Charles S. Lieber, M.D., Relationships between Nutrition, Alcohol Use, and Liver Disease M.A.C.P. [cited 2016 March 19]. Available from: http://pubs.niaaa.nih.gov/publications/arh27-3/220-231.html
21. Charles H. Halsted, Enrique A. Robles and Esteban Mezey. Intestinal Malabsorption in Folate-Deficient Alcoholics. The Williams & Wilkins Co. Published by Elsevier Inc.1974; 64(4):517-525
22. Garbutt JC., West SL and Carey TS. Pharmacological treatment of alcohol dependence. JAMA. Medline. [Web of Science].1999; 281:1318–1325
23. Dr. Karen Vieira. Comprehensive, Evidence-Based Guide to Effects of Drugs and Alcohol on Weight Gain or Loss. [internet] [cited 2016 August 27]: Available from: http://drugabuse.com/guides/substance-abuse-and-weight-change/
24. Reducing Alcohol Craving. [cited 2016 March 22]. Available from: http://www.alcohol.co.za/reducing_alcohol_craving.html
25. Smith, L. H., ed. Clinical Guide To The Use of Vitamin C. Life Sciences Press, Tacoma, WA, 1988
26. How to increase dopamine levels. [cited 2016 March 31]. Available from: http://mentalhealthdaily.com/2015/04/17/how-to-increase-dopamine-levels/
27. Helene Nnama. What causes Dopamine Depletion? [internet] [updated 2015 October 07; cited 2016 April 02]. Available from: http://www.livestrong.com/article/165491-what-causes-dopamine-depletion/
28. Karen Curinga, What Foods Decrease an Alcohol Craving? Demand Media. [cited on 2016 March 24]. Available from: http://healthyeating.sfgate.com/foods-decrease-alcohol-craving-7835.html
29. Mathew. Eating to Prevent Alcohol Cravings and Relapse. [internet] [updated 2013 July 27; cited 2016 March 12]. Available from: http://twelvewellness.com/eating-to-prevent-alcohol-cravings-and-relapse
30. JB Bardot. Supercharge your brain with foods that stimulate dopamine production. [internet] [updated 2013 May 29; cited 2016 March 31]. Available from: www.jbbardot.com
31. Musarrat Bano. Vitamin B Complex to Recover Alcoholism. [internet] [updated 2016 March 06: cited:2016 March 31]. Available from: http://www.nftips.com/2016/03/vitamin-b-complex-to-recover-alcoholism.html
32. Jonathan Benson and staff writer. How to kick the alcohol habit naturally. [internet] [updated 2013 March 11; cited 2016 April 05]. Available from: http://www.naturalnews.com/039432_alcohol_addiction_remedies.html
33. Brad Sly. The ABCs of Vitamins: Vitamin B3 (Niacin). [internet] [cited; 2016 April 05]. Available from: http://breakingmuscle.com/nutrition/the-abcs-of-vitamins-vitamin-b3-niacin
34. Good Health. [internet] [cited 2016 April 01]. Available From: http://www.ukandspain.com/nutrients/
35. Jolene M. Clinton-Helms. Substance-related Anxiety Disorder and how Amino Acids and Herbs may be utilized in treatment. Journal of Addictive Disorders. 2004;1-17
36. Johnny Bowden. Most Effective Cures on Earth. Fair Winds Press. 2008. p.50
37. Michael Gleeson. Dosing and Efficacy of Glutamine Supplementation in Human Exercise and Sport Training. The Journal of Nutrition. The American Society of Nutrition. 2008
38. Amouni Mohamed Mourad, Eder de Carvalho Pincinato, Priscila Gava mazzola, Maricene Sabha and Patricia Moriel. Influence of Soy Lecithin Administeration on Hypercholestremia. Hindawi Publishing Corporation. 2010.p.1-4
39. R. J. Nicolosi, T. A. Wilson, C. Lawton, and G. J. Handelman. Dietary effects on cardiovascular disease risk factors: beyond saturated fatty acids and cholesterol. Journal of the American College of Nutrition. 2001;20(5) 421S–427S
40. CS Lieber, SJ Robins, J Li and LM DeCarli. Phosphatidylcholine protects against fibrosis and cirrhosis in the baboon. Gastroenterology. WB Saunders Co. [Medline][Web of Science]. 1994;106:152–159
41. Kampov-Polevoy AB, . GarbuttJC, Janowsky DS. Association between preference for sweets and excessive alcohol intake: a review of animal and human studies. Alcohol & Alcohol. PubMed: 10414615: 1999; 34 (3): 385-395
42. Rebecca Place Miller, Science Writer. Nutrition in Addiction Recovery. Many Hands Sustainability Center.[internet] 2010.[cited 2016 June 11] Available from: http://mhof.net/sites/default/files/Addiction%20and%20Recovery%20Report.pdf