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Review Article

A CRITICAL REVIEW ON ALCOHOLISM WITH SPECIAL REFERENCE TO MADATYAYA

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ABSTRACT

The word Alcohol comes from an Arabic word 'Algwil' or 'al kuhl' meaning Body Eating Spirit (Liquors being called Spirits in English) or demons akin to. The Arabic word "Alpohl" means to redden the eyes. Alcohol is the most commonly used and widely abused psycho active drug in the world. Brewing of alcohol dates back to the beginning of civilization. The discovery of late Stone Age, bearing jugs depicting wine glasses have established the fact that fermented beverages existed as early as the neo-lithic period (10000 B.C.). Alcoholism is the disease which is chronic, progressive and fatal if not treated. More than 100000 deaths are caused all over world by excessive alcohol consumption every year. Direct and indirect causes of death include drunken driving, cirrhosis of liver, traumatic injuries, cancer and stroke.

KEY WORDS: Alcoholism, Alcohol, Liquor, Madatyaya, Mad, Madya.

INTRODUCTION

India is one of the largest producer of alcohol in the world and the dominant producer in South East Asia with 65% of total share. Alcohol is a depressant drug that slows down the activity of the brain and contains absolutely no nutrients¹. It doesn't relieve tension nor induces sleep or solve problems. Alcohol is an inebriant poison that intoxicates i.e. light headedness, produces mental confusion, headache, disorientation and drowsiness². Alcohol is an organic compound in which hydroxyl group (-OH) is bound to carbon atom of an alkyl³. All alcoholic beverages contain the same mood changing agent - ethyl alcohol though in varying percentage.

The term alcohol usually refers to ethyl alcohol or ethanol (C₂H₅OH).⁴Ethanol is also known as Grain alcohol. It is a clear, transparent, colourless, volatile liquid with a faint fruity odour and sweetish burning taste. It is a depressant and an anaesthetic and leads our brain to sleep starting with outer cortex which is a part of the brain that differentiate human beings animals and gives the ability of thinking and reasoning⁵. It is toxic by oral, inhalation, subcutaneous, intravenous, intra-arterial, intraperitoneal and dermal routes.

After oral administration, 20% of ethanol is rapidly absorbed from the stomach and 80% from the small intestine. Peak alcohol concentration in blood is reached in 30 to 90 minutes following the last drink. Many factors can delay absorption such as undiluted ethanol (by provoking pylorospasm), presence of food, delayed gastric emptying due to any cause and presence of congeners in alcohol⁶.

Rapid absorption of vaporized ethanol can be attained by inhalation, leading to intoxication. From an equivalent dose of ethanol, women achieve a higher blood alcohol level than do men as a result of decreased gastric alcohol dehydrogenase activity⁷. Liver damage occurs more in women as compared to men after

consumption of alcohol. 90% of ingested ethanol is metabolized in the body and only 5-10% is excreted unchanged by the kidneys, lungs, and sweat⁸. In adults, the average rate of ethanol metabolism is 100 to 125 mg/kg/hr in occasional drinkers, and up to 175 mg/kg/hr in habitual drinkers. The blood alcohol level generally falls at a rate of 15 to 20 mg/100 ml/hr. This may be higher (up to 30 mg/100 ml/hr) in chronic alcoholics.

Table 1: ETHANOL CONTENT (% BY VOLUME) IN DIFFERENT BEVERAGES⁹

Beverages	Ethanol content (% by volume)
Light beer	4-6 %
Heavy beer	6-8 %
Natural wine	10-15 %
Fortified wine	15-20 %
Whisky, gin, brandy	40-45 %
Rum	50%

USES¹⁰

Beverage-The most common alcoholic beverages include beer, wine, whisky, gin, brandy, rum, and vodka (Table no. 01). In addition, there are several indigenous preparations peculiar to particular regions such as arrack, toddy and fenny in India, tequila in Mexico, sake in Japan, eau de vie or fruit brandy in France.

Solvent-Alcohol is used as solvent for spray, after-shaves, colognes, mouthwashes and perfumes. The alcohol content in these are variable about 15 to 80 %.

Medicinal and therapeutic-Several multi vitamin, decongestant, antihistaminic and cough syrups contain varying percentage of alcohol (2 to 25 %). Ethanol has been popular in the past as an antiseptic. Surgical spirit used even today is mostly ethanol (90 to 95 %) with a small quantity of methanol (5 to 10 %) along with

traces of castor oil and methyl salicylates. Ethanol sponging is an effective remedy for hyperthermia.

Injection of dehydrated alcohol (absolute alcohol) in close proximity of nerves or sympathetic ganglia is said to be effective for the relief of long-lasting pain in conditions such as trigeminal neuralgia.

Antidote- It is used as an antidote for methanol poisoning and ethylene glycol poisoning.

Preservative- Rectified spirit (90 to 95 % ethanol) is used as a preservative for viscera, for chemical analysis.

Fuel- Ethanol is used to extract nucleic acids from whole tissue or tissue culture in virtually all biotechnology processes.

Table 2: MODE OF ACTION OF ALCOHOL¹¹

CNS	CVS	GIT	GENITO URINARY TRACT
1. Initially stimulation effect 2. Depressant 3. Affects memory concentration and insight 4. Mood Swing 5. Sensory and motor disturbances 6. CNS impairment	1. Tachycardia 2. Vasodilation of cutaneous vessels 3. Warm and flushed skin	1. Stimulates salivation 2. Increased mucous secretion 3. Congested mucosa 4. Erosive gastritis	1. Increased diuresis 2. Increased sexual urge because of inhibited restraint.

Table 3: CLINICAL FEATURES OF ACUTE ALCOHOL POISONING¹²

1. Stage of Well Being (50-150mg %)	2. Stage of Confusion (150-300mg %)	3. Stage of Coma (>300mg %)
1- Flushing of face	1- In coordination	1- Slow breathing
2- Talkativeness	2- Ataxia	2- Rapid and feeble pulse
3- Loss of self-control	3- Slow movements	3- Subnormal temperature
4- Loss of fine movements	4- Cannot walk Straight	4- Constricted pupils
5- Rude behaviours	5- Nasal accent	5- Unconsciousness
6- Sentimentalism	6- Blurred vision	6- Irreversible coma
7- Incoordination	7- Semi consciousness	7- Death due to A- Depression of higher centres B- Acute central anoxia C- Pneumonia or pulmonary death
8- Dilated pupils	8- Arousable unconsciousness	
9- Alcoholic smell		

Table 4: FEATURES OF ALCOHOL POISONING ACCORDING TO BLOOD ALCOHOL CONCENTRATION¹³

Blood alcohol concentration (mg/100ml)	Stage of intoxication	Clinical features
1-50	Sobriety (Decent)	Near normal behaviour
50-100	Euphoria (Delighted)	Feeling of wellbeing, Talkativeness, Increased self-confidence, Fine movements affected
100-150	Excitement (Delirious)	Emotional instability, Impaired memory Increased reaction time, Mild ataxia
150-200	Confusion (Dazed)	Disorientation, Confusion, Vertigo, Ataxia, Slurred speech
200-300	Stupor (Dejected)	General inertia, Diminished response to stimuli, Inability to stand and walk, Vomiting
300-500	Coma (Dead drunk)	Unconsciousness, Abolished reflexes, Subnormal temperature, Incontinence, Respiratory compromise
>500	Death (Dead)	Death due to respiratory failure

DIAGNOSIS

Blood alcohol concentration (BAC) is estimated by micro diffusion or electro chemical techniques. The latter is a rapid quantitative test and is done in casualty department. There is another technique known as immunoassay or gas chromatography which is commonly employed in Indian laboratories¹⁴. Though the result is accurate, they are often delayed several hours and are not really appropriate in the clinical scenario.

ACUTE & CHRONIC ALCOHOL POISONING¹⁵

ACUTE ALCOHOL POISONING

It is a medical term used to indicate a dangerously high concentration of alcohol in the blood, high enough to induce coma, respiratory depression or even death.

CHRONIC ALCOHOL POISONING

It is a condition in an individual which is a result due to consumption of large amounts of alcohol over longer period usually seen in habitual drunkards. It is characterized by.

Anorexia, vomiting, nutritional deficiency and pathological desire for alcohol intake can occur.

Alcoholic cirrhosis of liver, black out during intoxication, impaired mental functions, neurological damages; cardiomyopathy and skeletal myopathy may also develop.

Withdrawal symptoms on ceasing the intake

THE PATH OF ALCOHOL IN THE BODY¹⁶

Mouth: Alcohol enters the body.

Stomach: Some Alcohol gets into the bloodstream in the stomach, but most goes on to the small intestine.

Small Intestine: Alcohol enters the bloodstream through the walls of the small intestine.

Heart: Pumps Alcohol throughout the body.

Brain: Alcohol reaches the brain.

Liver: Alcohol is oxidized by the liver at a rate of about 0.2 oz per hour. Alcohol is converted into water, carbon dioxide and energy.

FATAL DOSE¹⁷

Fatal dose in adult is 6gm of ethanol/ kg body weight (adults) and in children it is 3 gm / kg body weight.

Levels of blood alcohol above 500mg /100 ml of blood.

FATAL PERIOD¹⁸

Usually 12 to 24 hours

Rarely 5 to 6 days

TREATMENT¹⁹

Secure airway

Ventilatory support

Stomach wash

Maintain adequate blood pressure and circulation.

Thiamine 100mg IV

50-100ml of dextrose IV

I.V. fluids

ALCOHOL WITHDRAWAL SYNDROME²⁰

Sudden cessation of alcohol by such person results in withdrawal reaction which may manifest as:

Abstinence syndrome develops 6 to 8 hours after cessation of alcohol: Characterised by tremors affecting hands and legs, agitation, sweating, nausea, vomiting, headache and insomnia.

STAGES OF MADATYAYA²²

PRATHAMA AVASTHA	DWITIYA AVASTHA	TRITIYA AVASTHA
Stimulation of energy Joys moods and spirit Interest in music Increased sexual urge Interest in foods and drinks, Sound sleep	Mental confusion Delirium Excessive talk Incoherent Movement Irritational Acts Drowsy and Lethargy	Losing consciousness Motion less, Confusion Loss of discriminative power

CLINICAL CONDITIONS MANIFESTED DUE TO INTAKE OF MADYA²³

Panaatyayam paramade panajirnaathaapi va
panaavibramugram cha tesham vakshyami lakshanam
(Ma.Ni.18/15)

According to Madhava Nidana, mainly four Clinical conditions arise due to improper consumption of madya. They are Panatyaya, Paramada, Panajirna and Pana Vibhrama.

MADATYAYA (PANATYAYA) GENERAL FEATURES

samanyam lakshanam tesham pramehohridayavasthaa.
vidbeda santataatrishnaasaumyajwaro aruchi.
siraparsvaasthirukkampo marmabedhatrikagraha.
urovibandhastimaram kasaswasaprajagara.
swedo atimatramvishtamba swayathuchitavibrama.

pralapaswarakshadirutklecho bramodukhapradarsanam. (A.S.Ni
6/15-27)

PANANTYAYA

The Vataja type of Panatyaya is marked by such symptoms like numbness and aching pain in the limbs, palpitation, a catching and pricking pain in the region of the heart and headache.

Alcohol hallucinations appear 24 to 36 hours after cessation of alcohol: Characterised by agitation, insomnia, and convulsions (seizures syndrome).

Rum fits occur 7 to 48 hours after cessation of alcohol: Characterised by tremor, hallucinations, clonic-tonic movements, with or without loss of consciousness.

Delirium tremens appears after 3 to 5 days after cessation of alcohol: Characterised by delirium tremens-Onset of disordered mental activity, clouding of consciousness, disorientation with loss of recent memory and hallucinations.

MADATYAYA

Madya is the alcoholic end product of Sandhana Kalpana (Ayurvedic biomedical fermented formulations). It possesses excessive Tamo Guna (literally means darkness) and causes derangement of mind. Madatyaya is very well described in Ayurvedic classics.

Buddhi lumpati yat dravyam madakaari taduchyate tamoguna pradhanam cha yatha madya suradhikam (Sa.Sm. Pra.4/21-22)

Acharya Sharangdhara while describing the madakari properties has included all the drugs with tamoguna (darkness-one among mahagunas) and which causes derangement of mind under Madya varga. It has 10 properties almost similar to that of poison.

MODE OF ACTION²¹

According to Sharangdhara Samhita, the substance which effects on brain and mind after indigestion is called as madya.

According to Bhava Prakasha, the liquid which produce narcotic effect on man after drinking is called as madya.

Perspiration, delirium, dryness of the mouth, burning sensation and fainting, fits and yellowness of the face and eyes are the features which distinguish the Pittaja type of Panatyaya. Vomiting, shivering and salivation are the indications which mark the Kaphaja type of Panatyaya. The symptoms of all the three types being exhibited in the one form, due to the concerted action of the three deranged bodily Doshas (the main three Ayurvedic fundamental constitutions of the body) is called Tri- Doshaja or Sannipataja type of Panatyaya.

PARAMADA (HANGOVER)

ushmanam angagurutwam virsanantvam sleshmaadhikatva
ruchimalpa mutrasangham
lingam parasya tu madasya vadanti tatgyatrisna rujasirasi chapi
bhedam. (Su.U.47/19-20)

Heat and a sense of heaviness in the body, bad taste in the mouth, excessive accumulation of Sleshma in the body, an aversion to food, suppression of stool and urine, thirst, headache and a crushing pain in the joints are the symptoms which the learned physician sets down to Paramada (reactionary effects of the abuse of wine).

PANAJIRNA

aadhmana mudghiranamallaraso vidahojeernasya panajanitasya
vadanti lingam.
gheyani tatra bhishaja suvinischitani pittaprapokapanitaani cha
karanani. (Su.U.47/20-21)

Distension of the abdomen, acid or sour taste in the mouth,
vomiting, and deficient gastric digestion are the symptoms which
are exhibited in a Panajirna type (alcoholic indigestion).

PANA VIBHRAMA

hridgatratoda vamathujwarakanta dhumamoorcha kaphasravana
murdharujo vidaha.
dwesha suranna vikriteshu cha teshu tam
panivibramusathakhilena dheera. (Su.U.47/21-22)

Aggravation of the deranged Pitta should be regarded by a
physician as the exciting factor of the disease. The malady which
exhibits such symptoms as piercing pain in the heart and limbs,
vomiting, fever, a sensation of the rising of fumes into the throat,
salivation, epileptic fits, headache, a burning sensation in the
throat and an aversion to all sorts of food and wine (in connection
with an abuse of wine) is called Pana Vibhrama.

TREATMENT²⁴

It is two types

Samanya Chikitsa (General Treatment) and Vishesha Chikitsa
(Specific Treatment)

SAMANYA CHIKITSA (GENERAL TREATMENT)

All the varieties of alcoholism are tridoshaja type with one
particular dosha dominating the other two. Hence in the treatment
of alcoholism, the predominant dosha is treated first, otherwise
the kapha dosha should be treated first as it dominates vata and
pitta in majority of cases.

Madya Prayoga

The clinical condition which arises from inadequate, improper or
excessive drinking of liquor is treated by giving variety of liquor
in proper dose and method. Because of its natural properties of
quick absorption, sharpness and hotness, the Madya (alcohol)
causes liquefaction of dosha and impart quick relief. It removes
obstruction in channels of circulation, improves digestive fire and
increases desire for food.

Dugdha Prayoga

Once the kapha dosha predominance is neutralized by Madya
Prayoga (the first method of treatment), the vitiated pitta and vata
are to be pacified by the administration of dugdha (milk) with its
demulcent and nutritive properties. Milk alleviates all the
symptoms and complication of pitta and vata. It acts as a boon
just like the rains for a tree which is extremely dried in summer.
Once the symptoms get subsided, milk is also withdrawn
gradually and is replaced with suitable dietary supplements.

Harshana Kriya

Alcoholism apart from physical symptoms also causes agitation
and derangement of mind. Hence to bring back mind to its normal
state from the state of depression, Ayurvedic classic recommends
certain Harshana Kriya (exhilarating methods) as a part of
physiological measures like beautiful parks, good food and
drinks, garlands, perfumes, entertaining parties, beloved and
submissive women, ponds with lotus flowers, pleasing
companion, melodious jokes, talks and songs.

VISHESHA CHIKITSA (SPECIFIC TREATMENT) OF PANATYAYA

Vataja Chikitsa

Chakra, Ardraka, Maricha, Kushta, Dipya, Sauvarcha Lavana +
Appropriate madya
Prithvika, hingu, dipyaka, Mahaushadha + Sauvarcha lavana
Drinks prepared with amra, amrataka, dadima, matulunga
Meat soup + Matulunga rasa

Pittaja Chikitsa

Madya + madhuradigana kashaya + honey + sugar
Concentrated ikshu rasa
Mudgasoup + sugar + ghee
Meat juice of lava, aina or tittiri bird

Kaphaja Chikitsa

Vomiting by wine + juice of bimbi and vidula
Meat soup of wild fatty animal and ikshu rasa
Mudgasoup + sugar + ghee
Meat juice of lava, Aina or tittiri bird

Sannipataja Chikitsa

All the measures which are adopted above and are appropriate to
balance the predominant dosha.

DISCUSSION

India is falling into the criteria for hazardous drinking with more
than half of all alcohol drinkers in the country. Alcohol abuse is
emerging as a major public health problem. Alcoholism or an
addiction to alcohol is often seen as a non-medical condition in
our country. Alcohol use plays a role in many social activities,
from the business lunch and parties to special occasions. Alcohol
is an inebriant poison that intoxicates i.e., induces mental
confusion, light headedness, disorientation and drowsiness. An
addiction to this poison often goes out of control for a person who
has a dependence on alcohol.

Drinking alcohol within a moderate quantity is fine and has a lot
of positive impacts on one's health. But when drinking alcohol
begins to impact one's life in a negative way, it might be a
symptom of alcoholism. Alcoholism is defined as an illness in
which the sufferer experiences a strong need for alcohol, a loss of
control during limiting alcohol intake, is developing a tolerance
and needs more alcohol to get the same effect and if he tries to
withdraw from drinking, he sees withdrawal symptoms. When
blood alcohol level reaches 0.10-0.15%, it affects the adaptability
of the eyes and the ability to judge distance is reduced drastically.
There is also an increase in the tendency to have an accident
especially with another vehicle. Such accidents may be termed
"Alcohol influenced". After considering all these factors, we can
say that excessive use of alcohol is no way good for health.

CONCLUSION

Trauma, violence, organ system damage, various cancers, unsafe
sexual practices, premature death and poor nutritional status of
families with heavy drinking fathers are all associated with
alcohol abuse. Hazardous drinking was significantly associated
with severe health problems such as head injuries and
hospitalizations. 15 to 20% of traumatic brain injuries were
related to alcohol use. Development of alcohol policy that
addresses issues related to alcohol taxation, restrictions on
production, number of sales outlets and hours of operation as well
as ensuring stricter implementation of rules on age restrictions,
drinking and driving laws and advertising should be
implemented. Research to highlight costs of alcohol use, monitor
consumption trends and generate data for advocacy efforts to
build political commitment and community support to reduce

harmful impact of alcohol are to be implemented and also practiced.

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