

Herbal Treatment for Alcohol Use Disorder - An Experiment in Tamilnadu, South India

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ABSTRACT

Background: One of the most perplexing problems in the society is alcohol use disorder. This problem affects the rural folk, especially the marginalized sections of the communities, farm laborers in Tamilnadu, South India. The farm laborers spend 70% of their wages for consumption of alcohol. This affects family, friends, neighbors, coworkers and even strangers too. Every year 13.5% of deaths occur unawares among the age group 20-39 years. This study set out to assess the improvement in clinical signs such as tremors, insomnia etc. applying herbal treatment with *Cassia Auriculata* among chronic alcohol patients.

Methodology: This was a quasi experimental study involving 60 chronic alcohol patients from three villages in Uthiramerur Taluk in Kanchipuram district of Tamilnadu. Stratified disproportionate sampling method was followed. Michigan Alcohol Screening Test (MAST) was administered to determine the status of the respondents. Those who scored more than three were selected. A social worker administered semi-structured interview schedule was used for data collection. The interview schedule dealt with five components of physiological deterioration induced by alcohol. An herbal treatment with *Cassia Auriculata* was carried out for 10 days. Data were collected pre and post herbal treatment. Data were analyzed using SPSS version 20.

Results: Findings: The findings showed that herbal treatment made remarkable improvement in the reduction of physiological deteriorations in physical appearance, gastrointestinal system, liver, cardiovascular system and central nervous system.

Conclusion: Herbal treatment for alcohol use disorder helped the chronic alcohol patients to regain their sober life. It can be continued if follow up steps are maintained.

Key words: alcohol abuse disorder, herbal intervention, physiological deterioration and social work.

INTRODUCTION

Alcohol, the bewitching liquid has proved to be the commodity for increasing the income of the economy and at the same time the troublesome commodity that man incessantly tries to overcome it but unfortunately drowns in it. The consumption of alcohol begins with joy and exhilaration but drags surreptitiously into an unmitigated foible of dependence. In the course of time people become alcohol dependent and this

dependence ends in physical, psychological and sociological deteriorations. Institutions, government and non-government have emerged to rehabilitate the alcohol dependents but still the problem is quite alarming. Due to alcoholism 3.3 million deaths occur according to World Health Organization (WHO) (2018) and out of these 13.5% deaths occur among the people of the age group 20-39 years. ^[1] In India, the young are lured by this ethereal liquid, in

the beginning; it is discovery of its effect but people find themselves on the road of no recovery.

Alcohol is a psychoactive substance with dependence-producing properties that has been widely used in many cultures for centuries. The harmful use of alcohol causes burden to family and friends, coworkers and strangers. Alcoholism now known as alcohol use disorder is a condition in which a person has a desire or physical need to consume alcohol, even though it has a negative impact on their life.

Most of the physiological deteriorations due to alcohol use disorder are more conspicuous among the alcohol dependents. The effects on physical appearance include hand tremors, nervousness, jaundice, dermatitis and finger clubbing. The problems connected with gastro intestinal tract are Dyspepsia, Nausea and vomiting, Recurrent Diarrhea, Recurrent Abdominal Pain and gastrointestinal bleeding. The problems of the liver pertain to fatty liver, Hepatitis, Cirrhosis and Ascites. Cardiovascular system suffers from palpitation, anemia and dilation of blood vessel.

The objective is to minimize the physiological deterioration induced by excessive consumption of alcohol making use of locally available materials and prevent the death knell among the marginalized societies and rehabilitate them from the malady. The physiological deteriorations can be reduced applying community based social work based herbal treatment using *Cassia Auriculata*

The significance of the experiment of herbal treatment is to make the respondents enjoy sober life with social work initiatives.

Herbal Treatment

Society has turned to Nature for the cure for the perils of diseases and healing for sicknesses. Incessant research has identified and validated plant derived substances from the leaves, rinds, fruits, roots and seeds of several plants for the treatment of various diseases. Health and nutrition compounds

have been synthesized from the leaves and fruits, roots and seeds as components of human diet.

Cassia Auriculata is a plant grown in villages in hedges and in rural households. The plant's flowering season is from October to March and intense during December and January. Rural folk use the flower for curing yellow fever (jaundice), and for purification of blood and liver and it is a coolant for the body. Agasthiar, one of the *siththars* in indigenous medical treatise has stated about the flowers of *Cassia Auriculata* thus: *Avaram poo pooththirukka / savarai kkandadhundo?* (When the avaram flower doth flower / Have you found anyone dying?) Bharadwaj et al (1981) have studied the effects of *Andrographis paniculata* in treating hepatotoxicants like ethanol, drugs and chemicals. [2] Interestingly, the leaves and flowers of *Cassia Auriculata* have been used by people of Tamilnadu, South India as commonplace local medicine for various illnesses for many decades. It is the ordinary plant seen in every household. Several other researchers have attempted to study the effects of *Cassia Auriculata*.

Kumar et al (2002) have attempted to study the effect of *Cassia Auriculata* experimenting with the rats and found it successful. [3] Kalaivani et al (2008) have experimented with *Cassia auriculata* using rats for treating diabetics and found the effect successful. [4] Joy et al (2012) makes a review that *Cassia Auriculata* contains a number of phyto constituents which reveals its uses for various therapeutic purposes. [5] Individual parts of the plant *Cassia Auriculata* can be used for the treatment of various disorders in human beings such as, diabetes, liver toxicity, fungal infection, microbial infection, inflammation, pyrexia and to relieve pain. Another plant which is traditionally useful for illnesses and diseases is the *Cassia Auriculata* Linn. Many researchers have done experiments with *Cassia Auriculata* to treat alcoholism.

One of the most significant experiments in this attempt is the study by WHO physician Bhakthareddy whose

efforts proved to treat alcoholism. Bhakthareddy (2007), a WHO physician and a renowned dermatologist has attempted a clinical study to evaluate the efficacy of an Herbal Formula in the management of alcohol addiction as compared to a Placebo. [6] 24 adult male chronic alcoholics were the subjects and were divided into two groups of 12 each. All study participants were admitted as in-patients and treatment was given for 7 days. Two different treatments were given, one for each group. One treatment was the proprietary Herbal formula with *Cassia Auriculata* as the primary active ingredient. The other treatment was a placebo treatment formulated primarily with only the excipients. Each subject was randomly assigned to one of the two groups (or treatment) as per a computer generated randomization schedule and the treatments were administered for seven consecutive days in the morning in empty stomach and the dose was kept constant throughout the study.

The subjects were evaluated clinically everyday and the subjects were also queried to score on their desire to consume alcohol during the treatment. No serious adverse events were observed during the study and there was one drop out in the placebo group. 12 of 12 subjects in the active treatment group scored no desire to consume alcohol after 4 days of treatment. However, only 5 of 11 subjects in the placebo group scored no desire to consume alcohol after 4 days of treatment. A proportional analysis was done to determine if there was any statistically significant difference between the treatments on the efficacy of the Herbal formula to reduce the desire to consume alcohol as compared to a placebo group. There was a statistically significant difference between the active and placebo groups to reduce the desire to consume alcohol after treatment in the study with the Herbal formula demonstrating potency to significantly reduce the desire to consume alcohol in alcohol-addicts as compared to placebo treatment. In addition

it was observed that there was noticeable improvement in clinical signs such as tremors, appetite and insomnia with Active treatment as compared to Placebo treatment.

Narmadha (2013) had highlighted the medicinal properties of *Cassia Auriculata*. It is used as medicine for its content of hydroxyanthraquinone in traditional medicine for treating urinary problems. [7]

Monisha et al (2017) investigated the antimicrobial, antioxidant and anti-inflammatory properties of *Cassia Auriculata* and they used methanol extracts to identify the medicinal properties of the plant. [8] The experiment of Senthilnathan and Renukadevi [9] investigated the effects of *Cassia Auriculata* in the central nervous system control of insulin secretion and suppression of the body's natural appetite-suppressing signals. The suppression of natural appetite is one of the maladies of the alcohol use disorder (2014). The analysis of the effect of the leaf extract by Gupta et al (2016) had shown that the leaf extract of *Cassia Auriculata* has the potential in reducing the ethanol-induced pathogenicity which might be due to its antioxidant potential. [10]

Hyperlipidemia is one the effects of excessive alcohol drinking which agglomerates cholesterol. The flower extract of *Cassia Auriculata* acts as an antihyperlipidemia. The study of Rajendran et al (2017) had established that the induced hyperlipidemia can be controlled by the activity of *Cassia Auriculata* flower extract in Oleic acid. [11] Interestingly, Nambirajan et al (2018) had shown that the extract of the buds of *Avaram Senaa* (*Cassia Auriculata* L.) are more efficient than the extract of the flowers in controlling the progression of disease. [12]

MATERIALS AND METHODS

The methodology applied in the present study was quasi experimental design and the sampling method adopted was the stratified disproportionate sampling method. Sixty participants were chosen from three

villages of Uthiramerur block of Kanchipuram district of Tamilnadu, South India. The participants were selected using Michigan Alcohol Screening Test (MAST). The participants had scored more than three in the test were selected for the herbal experiment.

The tools of the investigation are the semi-structured interview schedule prepared by the researcher. Michigan Alcohol Screening Test (MAST) determined the status of the participants. In herbal intervention the flowers of *Cassia Auriculata* were used to prepare the herbal medicine and administered to the respondents in the morning during sunrise for 10 days. It was the detoxification process. Regular counseling was provided by a physician, clinical psychologist and the social work counselor. During herbal treatment pre and post treatment data were collected. Inferential Analysis was done using SPSS version 20. In the pretest Cronbach Alpha was found to be more than

0.9 and the reliability of the semi structured interview schedule was confirmed.

Analysis

Physical Appearance

Analysis of the data was done using SPSS version 20. With regard to various physical appearance features before and after the treatment a vast majority (83.3%) who felt hand tremors before the intervention perceived that it has been reduced to less than one third (31%) post intervention. Nervousness felt by a vast majority (90%) of the respondents has come down from the severe status to one third (35%) after the intervention. Majority (50%) of the respondents who had severe problems like Jaundice, Seborrhea Dermatitis and Finger Clubbing had come down to less than one fourth (25%) after the treatment Thus there is a general reduction of the symptoms of physiological deterioration on the physical appearance of the alcoholics after the intervention has been made (Table 1).

Table – 1 Deterioration of Physical Appearance

Physical Appearance N = 60	Pre Intervention			Post Intervention		
	Very Severe	Severe	%	Very Severe	Severe	%
Hand Tremors	26 (43.3)	24 (40.0)	83.3	1 (1.7)	18 (30.0)	31.7
Nervousness	28 (46.7)	26 (43.3)	90.0	2 (3.3)	19 (31.7)	35.0
Jaundice	8(13.3)	32 (53.3)	66.6	1 (1.7)	16 (26.7)	28.4
Serborrheic Dermatitis	15 (25.0)	24 (40.0)	65.0	3 (5.0)	11 (18.3)	23.3
Finger Clubbing	5 (8.3)	29 (48.3)	56.6	--	8 (13.3)	13.3

(Source: collected data)

Table – 2 Deterioration of Gastro Intestinal Tract

Gastro Intestinal Tract N = 60	Pre – Intervention			Post Intervention		
	Very Severe	Severe	%	Very Severe	Severe	%
Dyspepsia (Discomfort of after Food taken)	14 (23.3)	31 (51.7)	75	-	15 (25.0)	25
Nausea and Vomiting	4 (6.7)	37 (61.7)	68.4	-	9 (15.0)	15
Recurrent Diarrhea	2 (3.3)	35 (58.3)	61.6	-	13 (21.7)	21.7
Recurrent Abdominal Pain	26 (43.3)	26 (43.3)	86.6	1 (1.7)	18 (30.0)	31.7
Gastrointestinal Bleeding	12 (20.0)	28 (46.7)	66.7	11 (18.3)	5 (8.3)	26.6

(Source: Collected data)

Gastro intestinal tract

It was revealed that the respondents who had felt severe problems like Dyspepsia (75%) Nausea (68.4%), Diarrhea

(61.6 %) had been reduced to 15% - 25%. More than three fourth (86.6%) of the respondents had severe Recurrent Abdominal pain, and it came down to

31.7%. Gastro intestinal bleeding pre-intervention was 66.7 % and it was reduced to 26.6 % after treatment (Table 2).

Liver

The analysis revealed that deterioration in the liver has been reduced after the treatment had taken place. More than half

(55%) of the respondents who had severe Alcohol Fatty Liver and Hepatitis before intervention have now come down by half after the treatment. Cirrhosis of Liver and Ascites are reported to be less (1.7 %) and zero respectively after the treatment (Table 3).

Table – 3 Deterioration of Liver

Liver N = 60	Pre – Intervention			Post Intervention		
	Very Severe	Severe	%	Very Severe	Severe	%
Alcohol Fatty Liver	10 (16.7)	40 (66.7)	83.4	-	20 (33.3)	33.3
Alcohol Hepatitis	5 (8.3)	33 (55.0)	63.3	-	16 (26.7)	26.7
Cirrhosis of Liver	-	3 (5.0)	5.0	-	1 (1.7)	1.7
Ascites (Skin Shinning)	1 (1.7)	2 (3.3)	5.0	-	-	--

(Source: Collected data)

Table – 4 Cardiovascular Deterioration

Cardiovascular system N = 60	Pre Intervention			Post Intervention		
	Very Severe	Severe	%	Very Severe	Severe	%
Palpitation	13 (21.7)	37(61.7)	83.4	-	17(28.3)	28.3
Dilation of Blood Vessel	7(11.7)	24(40)	51.7	-	6(10)	10.0
Anemia	23(38.3)	26(43.3)	81.6	-	16(26.7)	26.7

(Source: Collected data)

Cardiovascular system

Palpitation had been reduced to 28 % from 83.4% Dilation of blood vessels had been reduced from 83.4% to 28.3% and Anemia had been reduced from 81.6% to 26.7% (Table 4).

Table – 5 Deterioration of Central Nervous System

Central Nervous System N = 60	Pre Intervention			Post Intervention		
	Very Severe	Severe	%	Very Severe	Severe	%
Damages to Brain Cells	20 (33.3)	32 (53.3)	86.6	-	18 (30.0)	30.0
Loss of Memory	13 (21.7)	34 (56.7)	78.4	-	15 (25.0)	25.0
Blackouts	9 (15.0)	38 (63.3)	78.3	-	11 (18.3)	18.3
Ataxia (Loss of Balance)	20 (33.3)	31 (51.7)	85.0	-	14 (23.3)	23.3
Insomnia	11 (18.3)	41 (68.3)	86.6	1 (1.7)	15 (25.0)	26.7
Hallucination	10 (16.7)	32 (53.3)	70.0	-	15 (25.0)	25.0

(Source: Collected data)

Central Nervous System

Under the Central nervous system, 86.6 % of respondents had damages to nervous system and this had been reduced to 30%. Memory loss and blackouts had affected 78.4% and this had come down after treatment to 25% and 18.3 % respectively. Around 85% had Ataxia and insomnia and this had been reduced to around 25%. The respondents 70% had hallucination before treatment and after treatment only 25% had hallucinations. (Table 5)

Herbal Intervention

Table 6. Paired Sample t test between pre test and post test score due to Herbal Intervention

Dimensions of Deterioration	Test	N	Mean	Std. Deviation	Mean Difference	Correlation	Sig.	t	df	p
Physiological	Pre	20	45.500	8.233	28.100	0.564	0.10	17.979	19	0.00
	Post	20	17.400	6.276						
	Post	20	24.688	7.535						

(Source: Collected data)

Herbal intervention provides the herbal medicine for consumption as part of the treatment process. The consumption surely had brought more changes in physiological dimension. The above data indicate that there is a significant difference in the mean scores between pre test and post test scores with regard to the physiological dimension as the level of significance is less than 0.05.

The overall score with regard to the herbal intervention shows that there is a significant difference in the mean scores between pre test and post scores as the level of significance is less than 0.05.

Therefore it is proved that there is a significant difference in the pre test and post test mean scores due to the herbal intervention in the physiological dimension of deterioration among the persons who are dependent on alcohol.

Findings

The analysis revealed that the respondents in the investigation have improved in their status and the effects of deteriorations have been markedly reduced post herbal treatment. Social work based herbal intervention contribute positively towards the reduction of all the 4 dimensions of physiological deteriorations.

DISCUSSION

Herbal treatment using *Cassia Auriculata* had reduced the deterioration induced by alcohol use disorder. The anti-microbial, anti-oxidant and anti-inflammatory properties of the flowers of *Cassia Auriculata* reduce the deteriorations inflicted by alcohol use disorder. Hand tremors, jaundice, abdominal pain and intestinal bleeding have been reduced post herbal treatment. The numbers of cases of fatty liver, ataxia and insomnia have been greatly reduced with the administering of flower extract of *Cassia Auriculata*. In the case of cardiovascular system the treatment had minimized the cases of palpitation and anemia. The experiments of Rajendran et al [11] and Senthilnathan and Renukadevi [9]

further add vitality to the effects of herbal treatment in the present investigation using *Cassia Auriculata* for alleviating the deteriorations induced by excessive alcohol use.

CONCLUSION

The physiological deteriorations induced by excessive consumption of alcohol could be minimized using *Cassia Auriculata* for herbal treatment. Herbal treatment for Alcohol use disorder helps to maintain longevity of people leading a sober life especially among the rural folk. If follow up work is maintained after herbal treatment, the sober life continues as long as abstinence is sustained.

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