

# Alcohol dependence: Clinical aspects and diagnosis

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## **INTRODUCTION**

The consumption of alcohol in contemporary society is predominantly seen in a positive manner. It is difficult to recognize and determine the pattern of consumption that could be recognized as a disease and at the same time mobilize professional in the public health sector to reduce the problems resulting from the abuse of alcohol.

A double standard exists in modern society: drinking is tolerated and even promoted, but, at the same time, drinking in excess is discriminated and this confuses the population at large, which needs orientation from some sort of norms.

From the earliest of times, the definition of an alcoholic is associated with social status, something that supports social relationships and interactions. However, it was in 1849 that the term alcoholic came into use. It was Magnus Huss, who first defined it “as a conjunction of pathological manifestations of the central nervous system, in psychic, sensory, and motor spheres”, and was observed in individuals

that consumed alcoholic beverages in a continuous manner, in excess, and over a long period.

Later on, in 1960, the alcoholic was redefined by Morton Jellinek<sup>1</sup>, and the behavior of the alcoholic was from then on considered a disease, which had negative repercussions in society. Jellinek defined the alcoholic<sup>2</sup> as an individual whose consumption of alcoholic beverages could cause personal harm to oneself and to society at large. He categorized alcoholism as a disease based on the quantities of alcohol consumed.

Today the World Health Organization (WHO)<sup>2</sup> defines an alcoholic as an excessive drinker, whose dependence on alcohol is accompanied by mental disturbance, poor physical health, poor social relations, as well as poor social and economic behavior.

## **PHARMACOLOGY AND NUTRITIONAL IMPACT OF ALCOHOL**

Ethanol (or “the spirit of wine”, from Latin *spiritus vini*), whose chemical equation is  $C_2H_5OH$ , is a colorless liquid found in all alcoholic beverages.

Not every person has a tendency to become alcohol dependent. For alcoholic dependence to occur, it is fundamental that vulnerability and susceptibility to chemical dependence be formed by biological, psychological, social, and environmental conditions. From a medical point of view, it is relevant that the enzymes that metabolize alcohol in the organism are different from individual to individual, which is called biological vulnerability.

The pharmacology of alcohol is a particularly important theme to be discussed in this chapter because it facilitates the understanding of the problems encountered in the use of this substance in many individuals who are habitual drinkers.

Alcohol is a simple molecule that can easily move between cell membranes, and quickly reaches equilibrium between blood and tissue. The level of alcohol in the blood is expressed as milligrams or grams of ethanol per deciliter (i.e., 100 mg/dL or 0.10 g/dL); a level of 0.02 to 0.03, for example, corresponds to

the ingestion of one or two doses of alcoholic beverages. The human body can subsequently metabolize and excrete about one dose per hour.

Besides ethanol, other products are found in alcoholic beverages, for example, products of fermentation such as methanol, butanol, aldehydes, esters, histamines, phenols, iron, lead, and cobalt, which are mostly responsible for the differences in taste among the different types of beverages.

As a consequence of its high solvency in water, ethanol is rapidly dissolved in the blood stream where it is distributed to most of the organs and systems. It is absorbed by the mucous membranes of the mouth and esophagus (in small quantities), the stomach, the large intestine (in moderate quantities), and by the proximal portion of the small intestine, its main place of absorption (and where vitamin B is also absorbed). The absorption rate is increased when gastric evacuation is accelerated, for example, in the absence of proteins, fats, and carbohydrates, which interfere with absorption and other products of the fermentation of alcohol, by diluting a moderate percentage of alcohol (maximum 20% in volume) and in the presence of carbonated beverages (i.e., champagne) and gas.

Approximately 2% to 10% of ethanol (high and low concentrations of alcohol in the blood, respectively) is excreted directly by the lungs, through the urine, or through perspiration, but the greatest part is metabolized in the liver. The most important pathway of metabolism occurs in the cytosol of hepatic cells, where alcohol dehydrogenase (ADH) produces acetaldehyde, which is rapidly destroyed by aldehyde dehydrogenase (ALDH) in the cytosol and in the mitochondria of the hepatocyte. In high doses, aldehyde dehydrogenase may produce histamines, and by several mechanisms cause a decrease in blood pressure levels, nausea and vomiting.

The relative destruction of ALDH by disulfiram is responsible for alcohol intolerance in individuals who are alcoholic and are treated with this medication (Figure 1). The second metabolic pathway occurs in the smooth endoplasmic reticulum of the microsomal ethanol oxidizing system (MEOS), which is responsible for approximately 10% of the oxidation of ethanol when the concentration of alcohol is elevated in the blood stream.

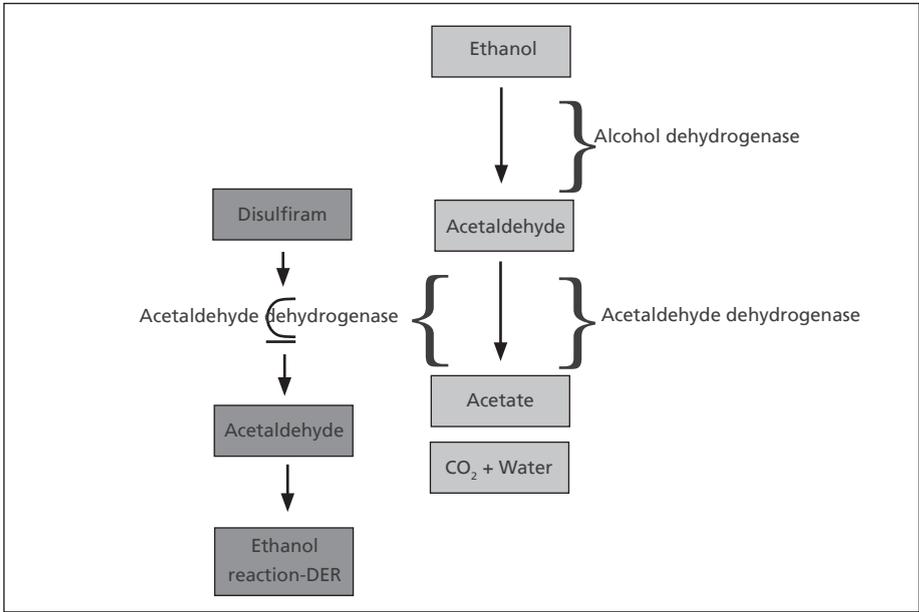


Figure 1 Disulfiram action mechanism.

Even though alcohol provides calories (a dose of alcohol contains 70 to 100 kcal), it lacks nutrients such as minerals, proteins, and vitamins. Alcohol may also interfere in the absorption of vitamins in the small intestine and diminish their storage in the liver because of the effects in folic acid, pyridoxine (B6), thiamine (B1), niacin (B3), and vitamin A.

Some individuals metabolize alcohol better than others, and it is possible that alterations in the biological system of the person may occur due to frequent or abusive alcohol consumption, or exhaustion of the organism, making a person who was tolerant to alcohol react to alcohol in a pathologic manner. It is also important to consider the quantity of alcoholic beverages consumed daily during an extended period. The borderline risk for males is a daily dose of approximately 60 g/day of pure alcohol and 40 g/day for females. This signifies that the margin of safety is below these daily doses. However, chemical dependence with its dev-

astating consequences only appears after 4 to 6 years of regular consumption for adolescents, and 6 to 8 years for adults.

## **SIGNS AND SYMPTOMS RELATED TO ACUTE AND CHRONIC USES OF ALCOHOL**

According to Dubowisk<sup>3</sup>, alcoholic individuals present a conjunction of common signs such as:

- a moderate flush or rubor of the face;
- heavy eyelids;
- watering of the eyes;
- erithrosis of the hands;
- alcoholic breath;
- lack of motor coordination;
- vertigo and imbalance;
- heavy perspiration;
- tremors in the extremities.

Bruises can indicate traumas occurring while intoxicated or changes in coagulation induced by hepatic insufficiency. However, there are also other signs related to chronic and excess consumption, such as muscular cramps, morning vomiting, abdominal pains, tachycardia, and chronic coughing.

Individuals that consume alcohol excessively reveal a group of physical and psychological symptoms. The physical symptoms are manifested by small signs of abstinence that can be due to neuromuscular disorders characterized by tremors, cramps, hives; digestive disorders with nausea or vomiting; neurological disorders, presented by heavy perspiration, tachycardia, hypertension, and psychic disorders characterized by anxiety, depression, irritability, insomnia, and nightmares. Tolerance is a latent symptom and is presented by a resistance to the effects of alcohol.

Psychological symptoms are characterized by three main elements: a change in behavior caused by alcoholic ingestion, loss of control, and an intense desire to consume more alcohol. Loss of control was a concept described by Jellinek<sup>1</sup> that helped in the understanding of alcoholic dependency. Loss of control is one of the principal symptoms of alcoholic dependence. The obsessive and intense desire to consume alcohol (also known as craving) is also one of the symptoms of dependency. It consists of the dissatisfaction related to the quantity of alcohol that the alcoholic individuals consume, and so they find countless ways to consume more.

## **DEFINITIONS**

Most people who drink are moderate drinkers. Even so, there is evidence that heavy drinking has become more and more frequent and it is disseminated both in male and female behaviors. Therefore, the appearance of problems due to this pattern of drinking is getting more common, even in individuals that do not have problems with alcoholic dependence<sup>9</sup>.

When problems with the abusive use of alcohol become more frequent in several areas of individual interaction, such as family, work and physical health, one should investigate criteria for alcoholic abuse and dependency.

## **ALCOHOL DRINKING PATTERNS**

The concept of drinking patterns covers medical as well as psychological and social aspects of alcohol use. The main patterns of alcohol consumption mentioned in scientific literature are moderate drinking, heavy drinking (HD) and heavy episodic drinking (HED).

Moderate drinking of alcoholic beverages is a difficult concept to define since it can be interpreted in different ways according to the perception of each individual. Usually, this definition is confused with social drinking, which signifies that alcohol is being consumed within the parameters accepted by society. However, frequently moderate drinking is looked on in an erroneous manner, as a form of alcoholic use that does not bring adverse consequences to the person who drinks.

The World Health Organization (WHO)<sup>2</sup> established that in order to avoid problems with alcohol, the acceptable dosage is up to 15 doses per week for males and 10 doses per week for females. A dose is equivalent to approximately 350 ml of beer, 150 ml of wine, or 40 ml of any distilled beverages, considering that each dose contains 10 to 15 grams of ethanol.

HED is also called binge drinking, and is defined as the consumption of five or more doses of alcoholic beverages on a single occasion for males, and four for females, at least once in a two week time frame.

The criteria for HED for the National Institute on Alcohol and Alcoholism (NIAAA)<sup>4</sup> is similar and defined as the consumption of five or more doses of alcoholic beverages on a single occasion for males, and four for females, without considering the frequency of this pattern of drinking. The definition of HED was created from scientific evidence reporting that these quantities of alcohol increase the risk of the individual presenting problems related to the use of alcohol later on.

The pattern of consumption that is denominated Heavy Drinking (HD) is defined by the NIAAA as any consumption of alcoholic beverages above what is considered moderate drinking, or the consumption of at least two doses of alcoholic beverages per day for males, and at least one dose for females. In other words, it is the consumption of alcoholic beverages that exceeds moderate drinking or the patterns of moderate drinking that are accepted by society. To drink heavily is an ample concept, and includes the HED pattern.

A growing body of epidemiological evidence has consistently demonstrated that HD is associated with a significant range of adverse situations for health and for society, such as: physical health harm, involvement in risky sexual behavior, unwanted pregnancies, acute myocardial heart attacks, alcoholic intoxication, falls and fractures, violence (including fights, domestic violence and homicide), traffic accidents, psychological and social problems (i.e. familiar and work problems), anti-social behavior, and difficulties in school – both for teenagers and for the population in general. Heavy drinking is also associated with an increase of death due to cardiac disease and a high risk of mental disorders, cancer and gastrointestinal diseases.

## **CLASSIFICATION OF ALCOHOLIC DEPENDENCY**

Cloninger<sup>5</sup> proposes three personality dimensions: the search the new, the avoidance of danger, and the search for reward. He classified alcoholism in two types (I and II). Babor<sup>6</sup> proposed two types (A and B) from the analysis of seventeen characteristics found in individuals who were alcoholic. There is also a proposal elaborated by Adés and Lejoyeux<sup>7</sup> that integrates Cloninger's<sup>5</sup> proposal with primary and secondary alcoholisms, as well as Jellinek's thesis, which used letters from the Greek alphabet to classify the several levels of alcoholism.

Cloninger<sup>5</sup> classified type 1 alcoholism as alcoholism due to the environment, the most frequent form found in both sexes; it begins around the age of 20, progresses slowly and is related to environmental and genetic factors. Type II alcoholism was defined as exclusively male and also begins around the age of 20, but progresses rapidly to dependence. It is characterized by changes in behavior during intoxication phases, impulsive behavior and social communication with fewer factors of risk related to genetic and environment.

Babor<sup>6</sup> classified type A alcoholism as one that starts at the age of 20, slowly evolves and with less frequency of associated psychopathology, better prognostic and a lesser frequency of mental disturbances as well as risk factors in childhood. Type B was classified as that which starts before the age of 20, with a greater frequency of alcoholism in the family, more serious dependency, greater frequency and association with drugs and psychopathic comorbidity, and a greater influence of risk factors in infancy, such as aggressive behavior and impulsiveness.

Adés and Lejoyeux<sup>7</sup> proposed a classification that integrated with Cloninger's, using a primary and secondary alcoholism classification system. Primary alcoholism includes 70% of all forms of alcoholism, and is defined as being male in predominance, beginning before the age of 20 and derived from biologic or genetic risk factors. In this form of alcoholism there is behavioral change marked by impulsiveness, aggressiveness, search for strong emotions, and quick evolution towards dependency, which implies heavy daily intermittent drinking. Secondary alcoholism embodies the remaining 30% of forms of alcoholism in which male predominance is less prevalent. It initiates after the age of 20, and has less

predominance of biological or genetic risk factors. The greatest risk factor is alcohol consumption as self medication, caused by mental disorders, anxieties, depression, or schizophrenia, many times responsible for changes in personality.

Finally, there is the classification of Jellinek<sup>1,10</sup>, which defines alcoholism as any alcoholic behavior that causes harm to the individual, to society, or both, and makes a distinction between alcoholism and alcoholic behavior in which alcoholism is defined by several levels considering its process as a disease and its symptoms. Utilizing the letters of the Greek alphabet, Jellinek<sup>1</sup> classified the levels of alcoholism as:

- alpha alcoholism: defined as social alcoholism, in which alcohol is utilized as an un-inhibitory factor in interpersonal relationships, and the symptoms are purely and exclusively physical, or in other words, due to intoxication. In this type of alcoholism neither loss of control nor the difficulty to abstain are considered. It is also defined as a category of problems involved with excessive drinking;
- beta alcoholism: defined as a type of alcoholism where physical complications are greater (i. e. gastritis and hepatitis), and can persist even though there is no physical or psychological dependence;
- gamma alcoholism: defined as a type of alcoholism which presents an increase in the tolerance to alcohol, metabolic adaptation for alcohol, and a craving and loss of control with the consumption of alcohol. Chronic alcoholics are included in this category;
- delta alcoholism: defined as a type of alcoholism in which the first three characteristics of gamma alcoholism are present together, but with the incapacity to remain abstinent instead of loss of control;
- epsilon alcoholism: defined as periodical alcoholism in which an individual after long intervals of abstinence loses control and develops a severe psychological dependency.

Even though Jellinek<sup>1</sup> does not consider the first two types as being alcoholics, this classification was not built as a gradation in alcoholism. On the contrary, it was conceptualized more as an indicator of social problems and specific therapies for each type of alcoholism. However, the treatment does not depend on the type of alcoholism; this aspect is established according to individual and social aspects of the dependent.

## **RISK FACTORS FOR ALCOHOLIC DEPENDENCE AND DIAGNOSTIC ASPECTS**

In order to become an alcoholic it is necessary to present certain psychological characteristics or certain personality traits. However, this does not mean an alcoholic type of person exists, because besides variations in temperament and character (i.e., a tendency to gather problems or live in a defensive manner in conflicting situations) that produce an inclination to drink, there are variations on the individual pattern of consumption of alcohol.

Many times alcohol is consumed due to the psycho-dynamic effects it provides. It is important that during the treatment of harm caused from drinking, better forms of socialization for the individual are found through development of social competency for the administration of conflicts and formation of an identity without alcohol. This task could be the most significant even though it is done differently in each culture.

Preventive measures, such as the diffusion of knowledge among people involved with the topic, inclusion of alcohol related educational material in the curriculum of schools, political deliberations with the intention of restricting the availability of alcoholic beverages, the prohibition of alcohol by inappropriate people for this type of consumption (i.e., children, pregnant women, and people who are sick), in inadequate places (i.e., work places where accidents could happen), and in improper moments (i.e., while driving) already exist in all societies where, in principle, alcohol is freely available.

The early identification of alcoholism is difficult, because intellectual, psychological and physical harms are not evident in the first stages. For a diagnosis of this nature the following indications should be observed<sup>11</sup>:

- the frequency of minor diseases (small accidents, inflammation of the gastric mucous, vegetative disorders and pain);
- unstable gait as an expression of neuro-pathological disorder;
- symptoms of abstinence from alcohol (nauseas, vomiting, tremors, fear and apathy);
- consumption of alcohol in the morning;
- hidden drinking;
- changing jobs and home location with no apparent reason.

Diseases due to alcohol consumption include: abnormal fatty deposits in the liver (hepatic steatosis), hepatitis, pancreatitis, cardiac diseases, muscular instability, peripheral neuro-pathological disorders, atrophy of the cerebellum, disturbances in coordination, deliriums, changes in humor, and dementedness caused by alcohol (i.e. Korsakoff's disease).<sup>12</sup>

The Diagnostic Statistics Manual IV (DSM-IV)<sup>8</sup> of the American Psychological Association (APA) defines alcoholic dependence as a repetition of problems associated with alcohol use in at least three of the seven areas of body functions during a minimum period of 12 months, and occurring concomitantly. Special emphasis is attributed to tolerance and/or symptoms of abstinence, and other associated disorders of serious gravity. Dependency occurs in males and females of all races and social and economic classes. Table 1 shows the patterns of mal-adjusted substance abuse leading to serious and harmful clinical effects that cause significant personal losses and suffering during a period of 12 months.

The diagnosis foretells a path of recurring problems that are associated with the use of alcohol and a consequent shortening of a lifespan by a decade or more. In the absence of dependency on alcohol, the individual may receive a diagnosis of substance abuse and present repetitive problems due to the use of alcohol in at

least one of the four areas related to lifestyle: the spheres of social, interpersonal, legal, and occupational problems or a persistence in the use of substances in risky situations (i. e. drinking and driving) as can be seeing in Table 2.

It is important to stress though, that the symptoms for alcohol abuse should never satisfy the criteria for addiction of this class of substance.

**TABLE 1 CRITERIA ON ALCOHOL DEPENDENCE – DSM-IV**

Tolerance is defined by any of the following aspects: - need of ingesting progressively greater quantities of the substance to reach intoxication or the desired effect; - accentuated reduction of effect with the continuous use of the same quantities of substances.
Abstinence, manifested by any of the following aspects: - abstinence syndrome, which is characterized by substance. Consult criteria A and B in the conjunction of criteria for abstinence in specified substances; - the same substance (or a strictly related substance) consumed to alleviate or avoid symptoms of abstinence.
A substance is frequently consumed in larger quantities or for longer periods than intended.
Persistent desire or unsuccessful attempt in order to reduce or control the use of the substance.
A long period is spent on the obtaining of the toxic substance on the use of substance, or on the recovery of the effects of the substance.
Important social, occupational, or recreational activities are abandoned or reduced due to the consumption of the substance.
The continuous use of the substance even though the individual is conscious of persistent physical or psychological problems or recurring problems that tend to be caused or intensified by the substance is present (i.e. consumption of cocaine even though the individual is conscious that his depression results from the substance; or continuous consumption of alcoholic beverages even though the person knows that his ulcer gets worse due to alcohol).

Source: APA. <sup>8</sup>

**TABLE 2 CRITERIA FOR ABUSE OF ALCOHOL – DSM-IV**

A. A maladaptive patter of substance use, leading to clinically significant impairment or distress, as manifest by one for more of the following features, and occurring at any time in the same 12 month period.
(1) The recurring use of substances resulting in failure to accomplish important obligations related to work, to school, to household duties (i. e. repeated absences or poor performance at work, absences, suspensions, or expulsions from school, negligence with children and household duties).

(2) The recurring use of substances in situations in which its use represents danger or physical harm (i. e. driving a vehicle or operating machinery under the influence of the substance).
(3) The recurrence of legal problems related to substance use (i. e. detentions for disorderly conduct).
(4) The continuous use of a substance in spite of persistent or recurring social or interpersonal problems caused or exacerbated by the effects of the substance (i.e. arguments with spouse on the consequences of intoxication or corporal aggressions).
B. The symptoms have never met criteria for substance dependence for this class of substance.

Source: APA.<sup>8</sup>

## CONSEQUENT PATHOLOGIES CAUSED BY ALCOHOLISM

Alcoholic dependency causes serious problems and consequences to the individual. Physical as well as psychological problems that can, in most cases, cause problems at work, disorganization of the family, aggressive behavior (i.e. homicides), traffic accidents, social exclusion, and other problems.

The consequent physical diseases are mostly from gastric and intestinal disturbances, such as ulcers, varicose veins in the esophagus, gastritis, and cirrhosis. Other neuromuscular disorders, such as cramps, itching, loss of strength, cardiovascular diseases (i.e. hypertension), sexual impotency and infertility are also consequences of alcoholism.

The mental disturbances according to DSM-IV<sup>8</sup> are delirium tremens; Korsakoff's syndrome<sup>13</sup>, and psychotic disorders, for example, changes in humor, anxiety, somnolence, and sexual dysfunction.

## FORMS OF TREATMENT

The treatment of alcoholic dependence involves interventions at several levels, since the disease is very complex in etiology and social, professional, and familiar implications. Therapeutic intervention is aimed at abstinence and dependence, as well as some psychotherapeutic interventions, for example, group therapy such as Alcoholic Anonymous (AA), and psychopharmacological interventions.

## **PSYCHOTHERAPIES**

The psychotherapeutic accompaniment of the alcoholic individual is indispensable. Discussions with the patient on the causes that brought him to substance abuse needs to be undertaken as well as the establishment of strategies and objectives that are essential for effective rehabilitation of the patient. This way, psychotherapy is fundamental in the therapeutic intervention of alcoholic dependency and abstinence.

There are many methods of intervention and, even though none can be proven to be totally effective, they continue to be important tools in the rehabilitation, psychological maturation, and the eventual return to society of these patients. Since alcoholism has many serious physical, intellectual, psychological, and social consequences, therapy programs are multidisciplinary and treatment is carried out at long-term with the objective of a satisfactory rehabilitation. It is also important to stress that rehabilitation is focused on the families of alcoholics as well as on the alcoholics themselves.

Even though in recent times the principles of behavioral therapy that is used to teach individuals to drink in a controlled and socially acceptable manner with individuals that drink in excess or in an abusive manner have shown some success, specialists are still skeptical to believe that this type of therapy can lead the alcoholic to drink in a controlled manner.

Even psychological long-term treatments fail to obtain satisfactory results with alcoholics. Nowadays the treatment programs adopted are in general conducted in a multidisciplinary manner and try to maintain long periods of abstinence, associated with the achievement of an ideal health state, and diminution of social harm caused by the alcoholic individual in his social circle. The measures are applied in the form of programs that are of short, medium and long duration and are successful mainly when the patients have continuous emergency care by professionals and are accompanied by self-help group therapies, such as AA.

Social support ideally starts from information collected in the social environment (research and social diagnostic), and from the resulting rehabilitation program.

The treatment of alcoholism can start with two types of approaches:

- individual help: an attempt to build relationships that strengthen the ego of the alcoholic by offering care and attention without restrictions. The proven means for this are stimulus, information sharing, relief of emotional pressure, discussion of problems, development of positive behavior, confrontation with inadequate behavior, direct intervention in order to change the real situation, and setting of limits and barriers;
- group help: participation in mutual help groups with people that have common interests or individuals facing the same situation. Problematic behavior provokes reactions in the members of the group, providing new experiences and changes in behavior, as well as in daily life situations. The group offers emotional support and acceptance of the fears, the mistrust, the aggressions, and frustrations which can be assimilated, making it possible for the individual to live with reality in a more positive manner with his or her demands. The individual gains self-confidence and understanding of the group thereby becoming more tolerant with failures and deceptions.

Scientific contributions to the understanding of the causes of alcoholism can be classified in four models that are both concurring and complimentary at the same time:

- psychoanalytic model: the consumption of drugs, especially drunkenness, is seen as a moment of regression based on the structure of a pre-morbid personality, which itself refers to a previous disturbance in mother and child relation. This theoretical scope uses terms such as pharmaceutical orgasm, substitute fetish for maternal breast, cannibalism, narcissism, and coprophagia, considered important in order to explain that phenomenon;

- psycho-pedagogical model: the consumption of each type of drug is considered a behavior acquired from social interaction, strengthened by the norms of society and culture. Positive experiences with toxic substances in the beginning of dependency can also reinforce it. The parameters belonging to this scope use theoretic terms such as learning model, therapeutic environment, social pressure, self-control, and capacity to postpone satisfaction;
- sociological model or socialization theory: the consumption of drugs and other substances is seen as an expression of a given social situation or a given family environment. In this way, conditional factors such as cultural changes, social and political factors are added in. The parameters belonging to this scope use theoretical terms such as repressive/permissive responses, social and economic status, world of established order, over-consumption and anonymity;
- multi-factorial model: the consumption of drugs is considered the simultaneous effect of many factors that are mutually integrated. This model reinforces the definition of WHO, but was adapted with some delay in European technical literature. The individual characteristics that bring about the development of drug dependency are summarized in this theoretical scope in terms such as drugs, personality of drug user, and society (or social circle).

For understandable reasons, the multi-factorial model is more useful for practical purposes, because there is not a common cause for the consumption of drugs as well as there is not only one type of consumer. In fact, what is found in the life history of an alcoholic and other drug dependent users are multiple factors that add up and form a series of conditions of which the only possible solution is found in addictive behaviors. At the same time, it is evident that it is hard to presume by consumer's history of life and the social environment which kind of drug will be chosen. This choice depends very much on the randomness of supply and demand.

There is in scientific literature consistent proof that the treatment of alcoholic dependency offers positive results for those who submit themselves to treatment. Approximately 70% of the patients manifest a reduction in the number of days

of alcohol consumption and improvement within six months of treatment. It also shows progress in the patient's familiar, marital and mental health aspects.

## **PHARMACOLOGICAL TREATMENT**

For several years, pharmacological interventions were restricted to the treatment of alcohol abstinence syndrome and the use of aversive drugs. In the last 10 years naltrexone and acamprosate have been indicated as important accompanying interventions in the psychosocial treatment in the syndrome of alcoholic dependence. But more recently ondansetron and topiramate have shown promising use in therapeutic strategies and are still under trial.<sup>14</sup>

### **Disulfiram**

Disulfiram is an irreversible and unspecific inhibitor to enzymes that decompose alcohol in the acetaldehyde stage. By inhibiting the enzyme aldehyde dehydrogenase (ALDH), there is an accumulation of acetaldehyde in the organism and that brings on the alcohol disulfiram reaction.

The counter indications for its use are: cirrhosis and hypertension, and it is not recommended for pregnant women due to the risk of causing congenital anomalies, the appearance of organic mental syndrome, and loss of the capacity to understand risky actions. Disulfiram was the first rehabilitation drug approved by the Food and Drug Administration (FDA) for the treatment of alcoholic dependence. The patients should totally abstain from drinking alcoholic beverages and be aware of the risks and principles of the treatment.

Supervised oral medication of disulfiram is effective when incorporated as a psychosocial treatment, in which new social abilities are created by means of counselling, as well as re-socialization and recreational activities that stimulate abstinence.

Disulfiram is a medication with good tolerance, but hepatitis is a rare occurrence and appears after 2 months of treatment. It is recommended that the patient be monitored for signs of hepatitis every 3 months in the maintenance phase of the treatment. In the first month of treatment, laboratory blood tests for bilirubin

should be taken every 2 weeks. The habitual dose is 250 mg/day in a single dose after an interval of at least 12 hours of abstinence. Patients can also benefit from a dose of 500 mg/day. The duration recommended for the treatment is 1 year.

## **Naltrexone**

Naltrexone is an opioid antagonist utilized as an accompanying drug in psychosocial rehabilitation in alcoholic treatment clinics because it mitigates the pleasurable effects of drinking alcohol.

In 1995 the FDA approved the use of naltrexone for the treatment of alcoholism because alcohol indirectly stimulates the reaction of opiate endogen and promotes the liberation of endogenic peptides (encephalin and b-endorphins) in the synapses.

The principal counter indications of naltrexone use are acute and chronic hepatitis. The principal adverse effect of naltrexone is nausea that generally coincides with the plasmatic levels reached in the first 90 minutes after ingestion.

The recommended dose of naltrexone for the treatment of alcoholism is 50 mg/day. The therapeutic scheme consists of 25 mg/day in the first week with a decrease in incidence and seriousness of the adverse effects. After this period the dose can be raised to 50 mg/day.

Clinical tests with naltrexone recommend a 12 week period of treatment. Naltrexone maintains low rates of relapse until the fifth month after its suspension. Monthly monitoring should be done with blood tests that evaluate bilirubin and fractions of serum transaminases in the first 3 months after its suspension. Naltrexone should be stopped if the elevations of transaminases remain.

## **Acamprosate**

Acamprosate (calcium acetyl-homotaurinate) inhibits excitatory glutamatergic activity, acting probably on the subclass of glutamate receptors (NMDA), especially when there is hyperactivity in these receptors. It has been approved in European countries for treatment of alcoholic dependency.

Acamprosate is considered a partial co-agonist of the NMDA receptor. There is evidence that this medication reduces the calcium reabsorption induced by glutamate

on the neurons. It suppresses conditional responses of alcohol in dependent animals, reduces the aversive effects of alcoholic abstinence and inhibits hyperexcitability of glutamate in the brain. Acamprosate presents good absorption when taken orally, but is diminished by concomitant ingestion of food. Besides this, acamprosate does not present any protein binding. All of these characteristics suggest that this medication does not exert significant medical interactions. Patients with hepatic disorders can also take acamprosate, since there are no pharmacokinetics alterations of this drug.

In general, the adverse effects reported are headaches, abdominal pains, nausea and vomiting, maculopapular rashes, somnolence, and inhibition of the libido.

Acamprosate dosage is as follows: patients who weigh more than 60 kg should take two 333 mg pills, 3 times a day, always before meals. Patients under 60 kg should take a lower dose of one 333 mg pill 3 times a day. The period of maintenance of this treatment is variable. Clinical studies have used the drug from 6 to 12 months.

## **FINAL CONSIDERATIONS**

The question about how to react to alcohol, to the alcoholic beverage industry and to the problem of alcoholics is an arbitrary position which is imposed on families, cities, and nations. The creation of multiple factor intervention measures that define the following desires are:

- a culture of abstinence or a society whose ideal is to be free from substances that cause dependence;
- an ambivalent culture or a society where alcohol consumption is an exceptional ritual;
- a permissive culture or a society that ensures individual rights and arbitrariness;
- a functionally disturbed culture or a society that destroys itself through alcohol.

Which of these environments is better to live in?

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