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**LIKE PARENT, LIKE CHILD?
CONSIDERATIONS ON
INTERGENERATIONAL TRANSMISSION
OF ALCOHOLISM**

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Like Parent, Like Child? Considerations on Intergenerational Transmission of Alcoholism

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Abstract

Alcoholism is an important socio-economical problem in contemporary society given that it could result in loss of human lives, increased medical care costs, loss of workforce and increased criminality. In this study the authors analyzed the factors which may determine or facilitate the intergenerational transmission of alcoholism. To this aim the authors performed a literature search on this topic in the electronic database PUBMED using adequate keywords. The results demonstrated the intergenerational transmission of the alcohol consumption and the consumption patterns. The transmission mechanisms are complex and have a multi-factorial determination in which both genetic and family factors are involved. The authors underline the importance of the psycho-social intervention at the family level for the interruption of the vicious cycle of intergenerational transmission of alcoholism, without neglecting the social context in which the family is situated.

Keywords:

alcoholism, intergenerational transmission, genetics, patterns;

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Introduction

Family can be viewed as a system of emotional relations which functions based on various processes, one of these processes being the intergenerational transmission. Carlson, Sperry and Lewis (1997) have shown that family is an interdependent emotional unit in which behavioral patterns are created in time and are repeated throughout several generations.

Family is the first environment in which the child learns social behavior and where he develops and consolidates his perception on his place in society. The way the parents behave and especially what they do has an important impact on the child's personality forming and development which also transposes to his life as an adult. Therefore, family has the largest influence upon the child's behavior and perception development and a parents' negative type of behavior is often adopted by the child (Rohner, 1986).

Alcoholism is the uncontrolled and exaggerated consumption of alcohol, in spite of knowledge of the medical side effects and the social consequences of its consumption. The factors which contribute to the addictive process and that modify the addict's behavior conduct are: the body's accustoming to alcohol along with neuroadapting and resistance buildup, facilitated by the: dopamine system, endorphin system, serotonin system and GABA system (Roberts & Koob, 1997)

According to OMS (2014) statistics, in 2010 in Romania, 2.4% of population suffered of alcoholism, and 69.35% of hepatic cirrhosis cases had alcoholism to blame. The same survey shows that 17.8% of road accidents are due to alcohol abuse. Therefore we can ascertain that alcohol addiction, in regards to the loss of human life, the increased medical care costs, the loss of workforce and increase in criminality represents an important socio-economical problem in contemporary society.

Methodology

This study's objective is the synthesis and analysis of factors which determine or facilitate the intergenerational transmission of alcoholism, this data being essential in the activities of preventing and treating this type of addiction. The data have been gathered in a systematic literature review which allowed the identification, selection and evaluation of the studies completed in this field up to now.

Articles search has been done through the use of the electronic database PUBMED using a combination of English keywords such as: “alcoholism, intergenerational transmission, genetics, addictive behavior, patterns”. The studies with data concerning intergenerational transmission have been selected as well as data regarding genetic and family environment factors involved in alcoholism.

Results and discussions

In PUBMED database, for the 1972-2014 period, there were 95 articles which corresponded to the keyword search mentioned earlier. Among these, 45 were included in this study. Articles like updates, case study or the ones that didn't align with this study's objective have been omitted. From the total of 45 articles, 21 investigate the genetic factors associated to alcoholism and 24 analyze family environment factors with relevance in alcoholism and intergenerational transmission.

1. Is there an alcoholism gene?

The idea that alcohol addiction could have a genetic basis is not recent and throughout time there were studies that followed to identify the genes that generate the vulnerability to alcoholism.

Identifying the genetic factors which predispose to alcoholism is essential for understanding the etiology of this disease, on the one hand and uncovering the different genetic expressions of alcohol addiction, on the other.

Researches carried on a number of families have shown that there is a certain similitude regarding the alcohol related problems between persons with different kinship. According to “*Collaborative Study on the Genetics of Alcoholism*” (COGA) the prevalence of abuse or addiction of a psychoactive substance on first-degree relatives of alcoholic persons is 44%, 80% of which, have shown abuse or addiction to alcohol.

Studies on twins have demonstrated that there is a significant intergenerational transmission in families with an alcoholic father and monozygotic twins as opposed to families with an alcoholic father and dizygotic twins (Gorwood, 2000). Other studies carried on twins have shown that biological parents' dependence of alcohol can manifest in the offspring, even if they are raised in foster care (Heath & Martin, 1988).

According to Cloninger (1987), not only alcoholism is inherited but also a certain type of consumption (precocious debut, severe abuse)

added to the transmission of antisocial behavior. Furthermore, it seems, the gravest of addictions are the easiest to inherit (Pickens et al., 1995).

However, clinical studies describe individual variation in the etiology of alcoholism and segregation studies show that it's not about the predominance of a single gene (Reich et al., 1988) but about a polygenic determinism. Phenotyping the addiction is based on classification criteria established in DSM, which take into account the polymorphism of expression, debut age, severity of addiction, comorbidity, severity of withdrawal, all of which are expressions of different genes.

The event-related potentials (ERP) show the electric activity of the brain as a response to specific sensorial or cognitive events which appear at a certain moment. Most of the studies that investigated the electro-physical deficits on alcoholics revolved around the P300 or P3 component. For a while it was assumed that the P3 deficit, which was observed in alcoholics, was the cause of the negative effects of alcohol on the brain. However, after a sufficient time of abstinence, most of the clinical manifestations characterized by the addiction of alcohol have returned to normal but the amplitude of P3 wave remained low (Porjesz & Begleiter, 1984; 1998). Indeed, a number of studies have reported low P3 amplitudes in youth with a high risk of developing alcoholism, such as children with alcoholic parents (Polich et al., 1994).

Understanding the base processes of alcohol addiction, has permitted to identify systems of neurotransmitters and psychoactive substances involved in attaining and maintaining addiction. This guided the search of a gene which could be involved in the etiology of the addiction. The main mediators involved in the apparition of alcohol addiction (Koob, 1992) are dopamine, opioids, serotonin and GABA. Blum et al. (1990) have shown that the gene of dopaminergic D2 receptors of chromosome 11 has a role in this process. Other studies regarding alcohol addicts have delivered contradictory results, in what concerns the association between the presence of dopamine D2 receptor gene of A1 allele and alcohol addiction (Blum et al, 1997; Edenberg et al., 1998; Schork & Schork, 1998). Thus, the results have shown that the frequency of A1 allele's presence varies dependent on the peoples studied (ethnic variations) but also within the same population (Feighner et al., 1972). Some studies carried on families with several

addicted members have shown that there exists no association between the two polymorphisms of the D2 gene and alcoholism.

There have been identified 14 genes which code different subunits of GABA receptor. The genes of $\alpha 1$, $\alpha 3$, $\alpha 6$, $\beta 2$, $\gamma 2$ subunits are polymorph and are involved in the regulation of alcohol tolerance. The relation between the presence of mutant alleles and the addiction to alcohol has been researched (Finckh *et al.*, 1996; Noble *et al.*, 1998; Sander *et al.*, 1999) but the results have been modest and they referred only to subpopulations of patients. Another study has shown a significant association between alcohol addiction and the presence of mutant alleles of subunits $\alpha 6$, $\beta 2$ and $\gamma 2$ but especially in the patients with Korsakoff syndrome (Loh *et al.*, 1999).

The results of these studies indicate that alcohol addiction is a complex and multifactorial pathology, being impossible to distinguish a single incriminating gene or phenotype.

The genetic etiology of alcohol addiction seems to be based more on the expression of some genes than on the presence or absence of others, which incriminates the genetic factor only as a risk factor for alcoholism, among other factors

2. Family environment factors in intergenerational transmission of alcoholism.

Identifying the family environment factors in intergenerational genesis and transmission of alcoholism is useful in determining the risk population which is the target for research and prevention. For determining the critical risk factors of alcoholism development, especially in alcoholics' children, there have been used studies methods like: retrospective studies, cross-sectional studies and prospective studies, the latter proving to be appropriate because it records the events in the moment of their production and evaluates the results at a later time. Prospective studies, though, have a necessary longer time requirement and implicitly higher costs (Reich, 1997).

Comparative studies on MZ and DZ twins show that the genetic factor is in fact an additive factor to the family environment factor.

A retrospective Australian study (Goodwin, 1979; Heath & Martin, 1988), carried on monozygotic twins, shows the influence of family environment among adolescent consumers. Prescott *et al.* (1994) support the influence of familial factors on alcohol consumption,

showing that these are responsible by up to 40% of inter-individual variability in twin pairs. A Dutch study on adolescent monozygotic twins shows that the sensibility to the environment varies by to age. The ones up to 16 years old are much more sensitive to the family environment, but this influence drops to zero for adolescents older than 16, in which case the genetic determinants have priority over the environment factors (Koopmans & Boomsma, 1996).

A 10 yearlong prospective study, with 304 participants, male students and male employees without superior education, which aimed alcoholics' children investigated the hypothesis that people with close alcoholic relatives, especially sons of male alcoholics, are more vulnerable to the effects of alcohol or react differently to alcohol consumption as opposed to people who have no close alcoholic relatives (Schuckit, 1982, 1994, 1996). This hypothesis is based on the observation that the same quantity of alcohol seems to induce less intoxication on the sons of alcoholics than on the ones that don't have an alcoholic father. The influence of familial factors in the development of alcoholism in offspring is demonstrated by a series of studies that show the fact that alcoholics' children have an increased risk to become alcoholic than the children of the persons that are not alcoholic (Windle & Searles, 1990).

2.1. Intergenerational transmission of the alcohol consumption pattern

The impact that the consumption or abuse of alcohol of the parents has on the consumption or abuse of alcohol of the child is much more relevant on alcoholics' children as opposed to the children with no alcoholic parents.

The parents' and the adult children's alcohol consumption patterns are intensely correlated, as studies carried in this direction have shown. One of such studies has shown that adolescents whose parents are alcoholics have a 5.1 higher risk chance of reporting a social consequence or to develop an alcohol or other drug related addiction (Chassin, Rogosch & Barrera, 1991).

Recent studies have suggested that a person's convictions regarding alcohol effects (what he/she expects as a consequence of alcohol consumption) can be important predictors of alcohol consumption and abuse. Furthermore, studies underline the impact of

the parental consumption on the child's perception in regards to alcohol consumption (Jacob & Johnson, 1997). Therefore, alcoholics' children's perception regarding the quantity and circumstances of parental alcohol consumption influences their own alcohol consumption, resulting in molding their behavior as an alcohol consumer (Ellis, Zucker & Fitzgerald, 1997; Brook, Brook, Gordon, Whiteman & Cohen, 1990; Kandel & Andrews, 1987). Thus, the consecutive effects of alcohol consumption in children are influenced by the conscious realization of the parents' alcohol consumer's patterns, starting at a young age (Zucker, Kincaid, Fitzgerald & Bingham, 1995). Also, studies have demonstrated that alcoholics' children have higher positive expectation regarding consumption, as though alcohol makes them feel better, which may represent the mechanism which is at the base of the relation between paternal alcoholism and the children's alcohol abuse (Ellis, Zucker & Fitzgerald, 1997; Sher, Wood, Wood & Raskin, 1996). Furthermore, the parents' alcohol consumption pattern modifications will determine modification in the expectancies the children have about alcohol (Chassin & Barrera, 1993).

2.2. The quality of the parent-child relationship

Familial variables which can affect child development (parents' disposition, marital and sibling influences in the socio-cultural context in which the family resides) unfold in the interaction between the parent and the child. This child and parent interaction is mostly characterized by 2 major parental directions: child's upbringing (affection and family support) and control (supervision and discipline). Lack of parental affection and precarious child monitoring are the lead causes in developing the risk of alcohol and other drug abuse (Jacob & Johnson, 1997).

A series of studies which tackled the quality of the parent-child relationship in families with an alcoholic parent suggest that paternal alcoholism is associated with bad monitoring of the child's behavior, which represents a risk factor for associating with an alcohol or other drug related addiction in the case of teenagers (Kandel & Andrews, 1987; Chasin, Pillow, Curran, Molina & Barrera, 1993; Chasin, Curran, Hussong & Colder, 1996).

The studies which have analyzed alcohol effects at a family level, in respect to family communication or affection which can influence

child alcohol consumption in families with alcoholic parents have shown that the family's interaction patterns can increase their child's risk of abusive alcohol consumption by generating more negative interactions while discussing problem solving, as opposed to families in which the parents don't suffer from alcoholism or any major psychopathology (Jacob & Krahn, 1988).

Likewise, strong associations exist between child's conduct disorders, teenage delinquency, adult antisocial behavior and alcohol abuse, as well as between adult antisocial conduct and his alcoholism as a result of being exposed to high levels of familial stress (Jacob & Leonard, 1994).

2.3. Psychiatric disorders in families associated with alcohol consumption

Epidemiologic Catchment Area Study shows that 37% of alcohol abusers or addicts have and associated psychiatric diagnose: antisocial personality disorder, bipolar disorder, schizophrenia, anxiety or affection disorders (Regier et al., 1990). The presence of psychopathological comorbidities in alcoholic parents may increase the child's risk of developing alcoholism or other mental health issues. Studies show that children with behavior problems derive from alcoholic parents, the latter suffer of a severe form alcoholism and mental illness. Alcohol consumption may become the way in which they exteriorize these behavior disorders. Studies show the association between a child's conduct disorder and the parent's antisocial personality disorder as well as between the child's depression and the parent's depression, in the context of the parent's abusive alcohol consumption or alcohol addiction (Chassin, Rogosch & Barrera, 1991; Brook, Brook, Gordon, Whiteman & Cohen, 1990; Zucker, Fitzgerald & Moses, 1995).

2.4. Family Anomy

Alcohol abuse affects family's dynamics and well function through the impact it has on each member.

Alcoholic families are defined by the lack of organization, increased conflict and low problem solving capacity (Sher, Walitzer, Wood & Brent, 1991; West & Prinz, 1987; Seilhamer & Jacob, 1990). Also, alcoholics' children have a higher risk than the non-alcoholic's children to be the target of domestic physical abuse to witness domestic

violence (Ellis, Zucker & Fitzgerald, 1997; Zucker, Ellis, Bingham & Fitzgerald, 1996). Alongside genetic factors, these familial factors contribute to developing alcoholism in these children due to the increased levels of family stress.

In this case of dysfunctional family the child's co-dependency phenomenon can be found, which represents a dependency on the addict, but also a certain type of relationship that is also transmitted to future generations. Therefore, alcohol abuse is perpetuated in an intergenerational vicious cycle from parent to child and from grandparents to grandchildren, the addiction being transmitted further.

2.5. Family socio-economical status

A series of studies indicate the fact that many psychopathology types, including alcohol or other drug consumption, associate with the family's low economical level. This, by itself, is not the only factor in the development of alcoholism but it can contribute to this addiction when in close relation to other familial factors (Ellis, Zucker & Fitzgerald, 1997; Robins & Regier, 1991). There are studies that show the fact that most of the time alcoholic's children originate from families with a low economical level, the parents' alcoholism owing, among others, to the financial stress to which these families are exposed.

Conclusions

Studies carried until now demonstrate that there is an intergenerational transmission of alcoholism, be it in the aspect of consumption by itself as well as the aspect of parents' consumption patterns which can be transmitted to their children. The transmission mechanisms are complex and have a multifactor determinism at their core, in which the genetic factor is involved on the one hand and the family environment factors on the other.

The genetic factor intervenes in the intergenerational transmission under the guise of polygenic determinism, whose phenotypic expression is influenced mostly by the family environment factors, among which there are: the quality of the parent-child relationship, psychiatric disorders associated to familial alcohol consumption, family anomy and family socio-economical status.

The analyzed studies in this article demonstrate the importance of psycho-social intervention at a family level for the interruption of this

vicious cycle of intergenerational transmission of alcoholism, without neglecting the social context in which the family is situated.

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