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Discourse

Nursing Research and Alcohol Problems: Learning from Recent History?

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Alcohol abuse and dependence are major public-health problems. They are more prevalent and lethal than problems related to the use of all illegal drugs combined, as well as many other diseases, including cancer. Among the emotional and psychological disorders faced by primary-care professionals, alcoholism is one of the most frequent.

In 1986, as a result of joint support from the Douglas Hospital Foundation and McGill University, the Alcohol Research Program (ARP) was launched at the Douglas Hospital Research Centre located in Verdun, Quebec, Canada. Its mission was to promote multidisciplinary research on alcohol abuse — its mechanisms, prevention, and treatment. The initial evidence that brought our group together was the familiar observation that alcoholism seemed to run in families. In addition, we shared a conviction that more could be discovered from the study of high-risk subjects, namely younger individuals in families with multiple members possessing a well-documented history of alcohol abuse, than from the study of alcoholic brains/minds deteriorated by years of abuse. Simultaneously, we launched treatment-outcome evaluations to test the hypothesis that genetic factors have a significant prognostic role in treatment outcome. In order to recruit research subjects, we sought collaborations with public and private facilities in the surrounding treatment community, most of which were residential centres at the time. We observed that much of the treatment community was strongly influenced by Alcoholics Anonymous (AA) and was sceptical about whether scientific research had more to offer than anecdotal observations and traditions developed since the 1930s.

A call for papers from *CJNR* prompted us to look back on some of the work carried out by ARP over the past 15 years. Admittedly, the logical development of this review is an a posteriori construction of the authors, and other members of our group might favour different trajec-

tories, objectives, and interpretations from those we privilege here. Specifically, in undertaking a purview that seems particularly pertinent to nursing research, teaching, and care in the alcohol area, we have downplayed some of the significant contributions made by our colleagues in arriving at our conclusions.

Initial Focus on Human Genetics

Genes substantially influence susceptibility to alcoholism (Heath, 1995). A positive family history is one of the most consistent predictors of risk for developing abuse and dependence, and first-degree relatives of alcoholics are two to seven times more likely than the general population to develop alcohol problems in their lifetime (Cotton, 1979; Kendler, Heath, Neale, Kessler, & Eaves, 1992). At the same time, no "gene for alcoholism" is likely ever to be identified: alcoholism is a polygenic disorder. Moreover, the current consensus is that a complex interplay of genetic, psychological, and environmental factors underlies the genesis of alcoholism. For example, we have found that vulnerability to psychological trauma, so often observed in alcoholic families, has a mixed base. As a family history of alcoholism subsumes the influence of shared family environment, our current research attempts to identify the processes by which the transmission occurs. In recent research in particular, our group (Stewart, Conrod, Samoluk, Pihl, & Dongier, 2000) is exploring heightened vulnerability to traumatic life events in an alcoholic environment. Unstable childhood predicts alcoholism, with marital discord and impaired parenting being most often implicated.

Underpinning Mechanisms of Genetic Transmission

Several "reward systems" in the brain, including dopaminergic (Wise & Rompré, 1989), serotonergic, and gamma amino-butyric acid (GABA) systems (Naranjo et al., 1987), as well as the opiate receptors (Volpicelli, Alterman, Hayashida, & O'Brien, 1992), are involved in the phenomenon of craving. The complex interaction between these neurotransmitters underlies the individual craving for alcohol. This vulnerability is not only genetically determined, but also increased by exposure; that is, dependence increases as months and years of excessive consumption increase neurotransmitter dysfunction. Two members of ARP, Robert Pihl (Pihl & Peterson, 1991) and Christina Gianoulakis (2001), have made worthy contributions to the literature on these mechanisms. One of the main findings of Pihl and his co-workers has been that the sons of alcoholics, before any significant exposure to alcohol, show a hyperactivity of the autonomic system when compared to control subjects. This is measured by increased heart rate. More importantly, exposure to a

test dose of alcohol has a significant dampening effect on this hyperactivity and normalizes the heart rate much more than the same dose given to control subjects. These observations provide a mechanism for explaining why sons of alcoholics are more likely than others to turn to alcohol at an early age.

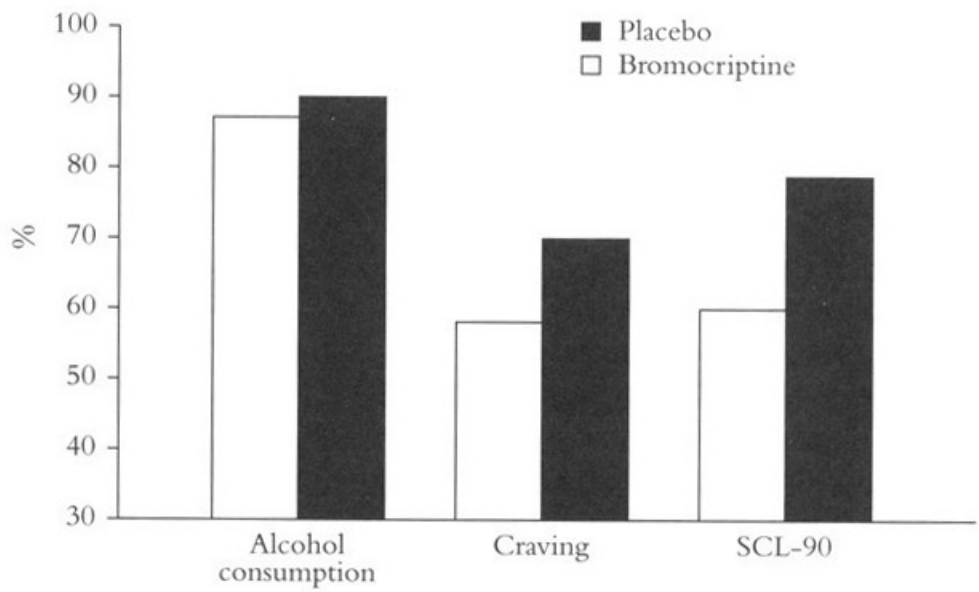
Another marker of predisposition discovered by Gianoulakis in our cohort of high-risk subjects is a lower than average plasma level of endogenous opioids such as beta-endorphins. A test dose of alcohol brings this level back to normal more quickly in these predisposed individuals than in normal controls (Gianoulakis, 2001). These findings provide evidence for a putative endogenous mechanism contributing to alcohol abuse. Predisposed individuals find alcohol a particularly effective self-medication for the behavioural correlates of these biological markers, namely anxiety and psychological distress. It was therefore logical, as other researchers had done before us, for us to turn to psychopharmacological agents in attempting to counteract neurotransmitter dysfunction. Even in the absence of genetic predisposition, such dysfunction is induced by long-term alcohol abuse.

An Alcoholic's (and a Biomedical Researcher's?) Dream: To Decrease Craving for Alcohol Through Medication

We, after others (Borg, 1983), used bromocriptine in double-blind, placebo-controlled studies (Dongier, Vachon, & Schwartz, 1991), with the rationale of activating the post-synaptic dopaminergic receptors that have been desensitized by long-term alcohol consumption. We observed spectacular improvements in craving, alcohol consumption, and associated psychological distress, as depicted in Figure 1. Bromocriptine produced only one significantly better outcome compared to the placebo group, namely that on psychological distress.

In another study, we observed similar results using buspirone, a serotonin partial agonist that modulated alcohol consumption in alcohol-preferring animal models (Malec, Malec, Gagné, & Dongier, 1996). Good outcome was observed with both active medication and placebo in study completers, with a small but significant advantage of the medication for measures of psychopathology. Other anti-craving agents (i.e., so-called antidipsotropics, or agents "directed against thirst") have been investigated. In particular, on the basis of Gianoulakis's (2001) above findings, blockers of opiatergic receptors such as naltrexone and nalmefene (Volpicelli et al., 1992) were used. The US Food and Drug Administration approved naltrexone for the treatment of alcoholism in 1994, nearly 50 years after disulfiram (Antabuse) had been approved. The bottom line (so far) is that pharmacotherapy for alcoholism produces relatively small

Figure 1 ***Improvement on Indices of Alcohol Consumption, Craving Intensity, and Global Psychological Distress Measured Using the Symptoms Checklist-90 (SCL-90)***



effects. As shown in the above experiments, the effects on treatment retention and/or drinking outcomes are significant but modest. The placebo groups in these studies show so much improvement (Kranzler & Van Kirk, 2001; Malec et al.) that large patient samples are necessary to statistically demonstrate the anti-craving effect of active medications, as well as the effects on alcohol-induced psychopathology.

A Closer Look at Our Placebo-Treated Control Groups

The findings summarized above led us, a few years later (it shows how slowly we think), to take a closer look (Wood, Vargas, Schwartz, & Dongier, 2001) at the process of change in the 70 subjects who had received placebos in two of our double-blind controlled studies (Dongier et al., 1991; Malec et al., 1996). Apart from receiving the inactive pill, these severe alcoholics (average consumption: 14 drinks a day) were keeping a diary of alcohol consumption (putatively, an effective behavioural intervention in itself). Psychotherapeutic interventions were purposefully kept to a minimum in order to facilitate the assessment of the pharmacological effect. We observed that the dropout rates for the placebo group and the medication group were comparable — at more than 40% after 8 weeks — a routine observation in alcoholism treatment studies. However, the most illuminating findings, previously overlooked

in our published papers, were the following: (1) the attrition process began *before* commencement of the study; (2) 53% of the subjects did not keep the initial appointment following the telephone screening interview to assess inclusion/exclusion criteria; thus, the data analysis (partial data presented in Figure 1) includes only completers of the study — none of the patients dropping out during treatment (approximately 40%) were considered; and (3) more than half (59%) of the retained sample was abstinent from Day 1; the self-selection process continued up to the end of the study, as relapse into drinking was responsible for the majority of dropouts among those initially abstinent.

We concluded (Wood et al., 2001) that the findings, like those presented in Figure 1 as well as in most of the literature on the psychopharmacology of alcoholism, are considerably biased by the removal from analysis of subjects who self-select out of clinical trials at some point. It is reasonable to assume that the very selected cohort that reaches the end-point of a study is at a higher motivational stage (DiClemente & Hughes, 1990), which gives them the best possible prognosis. In readiness-for-change terms, they are at the action stage, arguably unlike the majority of untreated alcoholics.

To Drink or Not to Drink: "Spontaneous Remissions," "Natural" History, and the Delicate Balance of Motivation

Many randomized trials in alcoholism, including our studies re-analyzed above, lack a perspective that takes into account the "natural" history of the disorder and the role of "spontaneous" remission. Vaillant's longitudinal research, based on 35 years of follow-up data summarized in two epoch-making books (1983, 1995), has shed new light on what happens outside of the artificial world of treatment and most research. A majority of alcohol abusers (75–85%) never seek treatment and die prematurely without formal or informal treatment such as AA membership (Sobell, Ellingstad, & Sobell, 2000; Vaillant, 1983). Spontaneous remissions significantly outnumber remissions following treatment, as demonstrated by the results of the US National Longitudinal Alcohol Epidemiology Survey (Dawson, 1996). We also observed in our placebo groups, as well as in their counterparts who benefited from active medication, that a concentration of individuals became abstinent or drastically cut down on their consumption *before entering the clinical trial.*

Many researchers (King & Tucker, 1998; Klingemann, 1991; Sobell et al., 2000) have underlined the role of motivation in the natural history of alcoholism. As observed in our cohort (Wood et al., 2001), early signs of high motivation predict treatment outcome and stability. Abstinence right from the start is a good prognosis sign. A majority of subjects (41 vs. 29)

were already abstinent on Day 1, before commencement of the study, but this abstinence persisted for only about 50% of subjects. In fact, 90% of those who were drinkers at Day 1 eventually were treatment failures. Most remained heavy drinkers and very few reached abstinence. These findings are consistent with the hypothesis that readiness to change plays a major role in reducing alcohol consumption (Miller & Rollnick, 2002) and contributes much to the results attributed to either psychosocial or pharmacological treatment.

The Role of Brief Interventions, in Particular Motivational Interviewing

The search for new antidipsotropic agents goes on. However, the importance of motivation, which, in the absence of other treatment, is associated with outcomes that rival those seen with anti-craving drugs, has led to growing interest in brief interventions. A brief intervention is intended to increase motivation to change alcohol use with minimal clinician involvement (typically from several minutes to about four sessions over a flexible period of time). The most influential brief intervention currently, Motivational Enhancement Therapy (MET), has been developed over the past 20 years by Miller and Rollnick (2002). It is essentially a counselling style for eliciting rapid behaviour change by helping clients to explore and resolve their ambivalence with respect to changing substance use, as well as other health behaviours. Direct persuasion, argumentation, confrontation, and a paternalistic consulting style are avoided. Although inspired by Rogers's reflective and non-directive listening, it has distinctive features that seem to be shared by all effective brief interventions (Bien, Miller, & Tonigan, 1993). Full details can be found at www.motivationalinterview.org

In order to address brief intervention prospectively, while at the same time attempting to render the finding clinically useful, we (Brown, Dongier, Latimer, Kokin, & Ross Brown, 2002) devised a two-pronged research methodology. One arm (Experimental Arm) involved a controlled randomized clinical trial of two different brief interventions (i.e., two versus four sessions of treatment) in a naturalistic, community-recruited sample presenting with multiple substance-abuse disorders. The second arm (Clinical Arm) involved patients randomized into either a four-session MET or a four-session non-specific support group prior to their participation in 3-week outpatient treatment programs. All brief interventions were provided in a group format. Our findings revealed few differences between different brief interventions within both arms. Intriguingly, comparisons between the two arms also failed to discern significant differences in improvements in most measures of substance-

abuse severity at 6-month post-treatment follow-up. This means that outcomes for participants treated briefly (i.e., only 2–4 sessions) in our laboratory and those exposed to intensive treatment, *in addition to* our manipulation of brief pre-treatment programs, were quite similar. These findings are based on correlational data and cannot be attributed solely to exposure to either condition. Yet the data are consistent with the idea that brief intervention is a reasonable alternative to far more costly and intrusive intensive treatment.

Frontline health-care settings represent an important early-stage entry point into the health-care system for substance-abusing individuals.

A significant role for primary-care nurses and physicians in providing brief substance-abuse interventions in these settings seems logical. However, this might pose a challenge for many physicians, primary-care as well as specialist. Opportunistic brief intervention at the frontline requires systematic screening. Moreover, brief intervention requires physicians to go beyond reliance on entrenched but questionable approaches to substance abuse in many frontline settings (e.g., avoidance, prescription of AA attendance). However, up to 90% of primary-care physicians fail to recognize substance abuse in their outpatients (Danielsson, Rivera, Gentilello, & Maier, 1999; McPherson & Hersch, 2000). Even when broad physician-based brief screening and intervention programs have been implemented as part of a research investigation, they have largely failed to persist beyond study termination (Drummond, 1997; Heather, 1996).

Such findings underscore the complexities involved in translating research into practice. In our experience, it may be easier for nursing staff to "retrofit" their existing clinical interviewing skills to be consistent with those embodied in the brief motivational counselling style, which entails the presentation of information and objective, personalized feedback about substance use in a neutral yet empathic manner. However, in order to avoid earlier failures in bridging the gap between research and practice, research is needed to explore the program adaptations and conditions necessary to ensure optimal uptake of this knowledge by nursing professionals in frontline settings.

Conclusion

Over the past decade, research has succeeded in clarifying some of the mechanisms that underlie the risk for developing and reinforcing substance abuse. Incidental to these findings, powerful natural recovery processes have been observed, supporting the use of opportunistic, brief interventions in settings where substance abuse is often encountered, such as the frontline. The nursing professional seems exquisitely posi-

tioned to engage in effective yet brief intervention for substance-abuse disorders encountered in such settings. However, more research is needed to better adapt brief-intervention technologies to the realities confronted by nurses in the clinical setting.

References

Bien, T. H., Miller, W. R., & Tonigan, S. (1993). Brief interventions for alcohol problems: A review. *British Journal of Addiction, 88,* 315–336.

Borg, V. (1983). Bromocriptine in the prevention of alcohol abuse. *Acta Psychiatric Scandinavia, 68,* 100–110.

Brown, T. G., Dongier, M., Latimer, E., Kokin, M., & Ross Brown, D. (2002, September). *Brief intervention for substance abusers: Effectiveness and efficacy.* Poster session presented at Addictions 2002, Eindhoven, Netherlands.

Cotton, N. S. (1979). The familial incidence of alcoholism: A review. *Journal of Studies on Alcohol, 40*(1), 89–116.

Danielsson, P. E., Rivera, F. P., Gentilello, L. M., & Maier, R. V. (1999). Reasons why trauma surgeons fail to screen for alcohol problems. *Archives of Surgery, 134*(May), 564–568.

Dawson, D. D. (1996). Correlates of past year status among treated and untreated persons with former alcohol dependence, United States. *Alcoholism: Clinical and Experimental Research, 20*(4), 771–779.

DiClemente, C. C., & Hughes. S. O. (1990). Stages of change profiles in outpatient alcoholism treatment. *Journal of Substance Abuse, 2,* 217–235.

Dongier, M., Vachon, L., & Schwartz, G. (1991). Bromocriptine in the treatment of alcohol dependence. *Alcoholism Clinical and Experimental Research, 15*(6), 967–977.

Drummond, D. C. (1997). Alcohol interventions: Do the best things come in small packages? *Addiction, 92,* 375–379.

Gianoulakis. C. (2001). Influence of the endogenous opioid system on high alcohol consumption and genetic predisposition to alcoholism. *Journal of Psychiatry and Neuroscience, 26*(4), 304–18.

Heath, A. C. (1995). Genetic influences on drinking behaviour in humans. In H. Begleiter & B. Kissin (Eds.), *The genetics of alcoholism* (pp. 82–121). Oxford: Oxford University Press.

Heather, N. (1996). Public health and brief interventions for excessive alcohol consumption: The British experience. *Addictive Behaviors, 21,* 857–868.

Kendler, K. S., Heath, A. C., Neale, M. C., Kessler, R. C., & Eaves, L. J. (1992). A population-based twin study of alcoholism in women. *Journal of the American Medical Association, 268*(14), 1877–1882.

King, M. P., & Tucker, J. A. (1998). Natural resolutions of alcohol problems without treatment: Environmental contexts surrounding the initiation and maintenance of stable abstinence or moderation drinking. *Addictive Behaviors, 23,* 537–541.

Klingemann, H. K. H. (1991). The motivation for change from problem alcohol and heroin use. *British Journal of Addiction, 86,* 727–744.

Kranzler, M. R., & Van Kirk, J. (2001). Efficacy of naltrexone and acamprosate for alcoholism treatment: A meta-analysis. *Alcoholism Clinical and Experimental Research, 25*(9), 1335–1341.

Malec, E., Malec, T., Gagné, M. A., & Dongier, M. (1996). Buspirone in the treatment of alcohol dependence: A placebo control trial. *Alcoholism Clinical and Experimental Research, 20*(2), 307–312.

McPherson, T. L., & Hersch, R. K. (2000). Brief substance use screening instruments for primary care settings. *Journal of Substance Abuse Treatment, 18,* 193–202.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change.* New York: Guilford.

Naranjo, C. A., Sellers, E. M., Sullivan, J. T., Woodley, D. V., Kadlec, K., & Sykora, K. (1987). The serotonin uptake inhibitor citalopram attenuates ethanol intake. *Clinical Pharmacotherapy, 41,* 266–274.

Pihl, R. O., & Peterson, J. B. (1991). Attention-deficit hyperactivity disorder, childhood conduct disorder, and alcoholism: Is there an association? *Alcohol Health and Research World, 15*(1), 25–31.

Sobell, L. C., Ellingstad, T. P., & Sobell, M. B. (2000). Natural recovery from alcohol and drug problems: Methodological review of the research with suggestions for future direction. *Addiction, 95*(5), 749–764.

Stewart, S. H., Conrod, P. J., Samoluk, S. B., Pihl, R. O., & Dongier, M. (2000). Posttraumatic stress disorder symptoms and situation-specific drinking in women substance abusers. *Alcoholism Treatment Quarterly, 18*(3), 31–47.

Vaillant, G. E. (1983). *The natural history of alcoholism: Causes, patterns, and paths to recovery.* Cambridge, MA, and London: Harvard University Press.

Vaillant, G. E. (1995). *The natural history of alcoholism revisited.* Cambridge, MA, and London: Harvard University Press.

Volpicelli, J. R., Alterman, A. I., Hayashida, M., & O'Brien, C. P. (1992). Naltrexone in the treatment of alcohol dependence. *Archives of General Psychiatry, 49,* 876–880.

Wise, R. A., & Rompré, P. P. (1989). Brain dopamine and reward. *Annual Review of Psychology, 40,* 191–225.

Wood, W. J., Vargas, J., Schwartz, G., & Dongier, M. (2001). À propos de la guérison naturelle, de l'effet dit "Placebo" et des études psychopharmacologiques dans le traitement de l'alcoolisme. In M. Landry, L. Guyon, & S. Brochu (Eds.), *Impact du traitement en alcoolisme et toxicomanie* (pp. 173–188). Quebec: Presses de l'Université Laval.

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