The Clinical Course of Alcoholism in Trinidad and Tobago*

L. KARELIA MONTANE-JAIME, M.D., SAMUEL SHAFE, M.D., ROMA JOSEPH, M.D.,[†] SHELLEY MOORE, B.A., DAVID A. GILDER, M.D.,[†] HELENE CROOKS, M.D.,[†] CELIA RAMCHARAN, M.D., AND CINDY L. EHLERS, PH.D.[†]

Department of Psychiatry and Pharmacology Unit, Department of Para-Clinical Sciences, Faculty of Medical Sciences, University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies

ABSTRACT. Objective: The clinical course of alcoholism has been described as a series of distinct, alcohol-related life events that occur in an orderly sequence. However, whether that sequence differs, depending on ethnicity and country of origin, is less clear. The purposes of this study were to investigate the sequence and progression of alcohol-related life events in individuals of East Indian (Indo) and African (Afro) heritage on the islands of Trinidad and Tobago, and compare those results with data reported previously by the Collaborative study for the Genetics of Alcoholism (COGA). **Method:** Participants who were alcohol dependent (based on Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised, criteria) and of Afro-Trinidadian and Tobagonian ancestry or Indo-Trinidadian ancestry were recruited from inpatient treatment facilities. A total of 148 alcohol-dependent men and women completed the Semi-Structured Assessment of the Genetics of Alcoholism, which assessed the physical, psychological, and social manifestations of alcohol

dependence and other psychiatric disorders. **Results:** A high degree of similarity in the sequence of alcohol-related life events was found between Indo-Trinidadian, Afro-Trinidadian and Tobagonian, and COGA participants. However, Trinidadian and Tobagonian alcoholics were more likely to endorse severe alcohol drinking in the form of binges (2 or more days of intoxication), blackouts, withdrawal, and medical consequences; however, they were less likely to endorse aggressive acts associated with drinking. Progression to alcohol dependence was significantly slower in Trinidadian and Tobagonian alcoholics than in the U.S. population of alcoholics, but severe alcohol symptoms were more commonly endorsed in Trinidadian and Tobagonians. **Conclusions:** Identifying ethnic and country of origin differences in the clinical course of alcohol dependence may assist in the development of culturally sensitive intervention and prevention programs. (*J. Stud. Alcohol Drugs* 69: 834-839, 2008)

DESPITE THE LONG HISTORY of recognition of alcoholism as a disease, there are still many questions concerning whether it has a distinct and definable clinical course (Schuckit, 1995). Jellinek (1946) first published a description of the course of alcoholism and suggested that alcohol-related problems progressed in an orderly sequence from psychological to physical addiction, while cautioning that not everyone would experience all of the symptoms in the same order over time. Schuckit and colleagues (1993), using a structured personal interview, further advanced the description of the clinical course of alcoholism based on the relative order of appearance of major alcohol-related events. This approach had the advantage of allowing the recording of the events in a more objective and verifiable manner than

those originally described by Jellinek. In this and subsequent articles, Schuckit and co-workers (1993, 1995, 2002) reported a high level of similarity across subgroups of alcoholics (e.g., inpatients and outpatients, males and females, presence or absence of family history, secondary diagnosis). More recently, Ehlers et al. (2004) confirmed the high level of similarity of the time course of the alcohol-related life events among men and women of Native American heritage. For the first time, there was evidence that the clinical course of alcoholism did not differ based on ethnic heritage.

Trinidad is the southernmost island of the Lesser Antilles. Tobago, the sister island, lies 20 miles northeast of Trinidad. The twin islands are English speaking and constitute the Republic of Trinidad and Tobago. The population of Trinidad and Tobago is multi-ethnic but is primarily composed equally of people of East Indian (Indo) and African (Afro) origin (Central Statistical Office, 2003). Ethnic differences in acute and chronic reactions to alcohol, alcohol drinking habits, and vulnerability to alcohol-related organ damage have been reported anecdotally on the islands. This ethnic variation has been suggested to be the result of a combination of genetic and familial determinants, as well as cultural and social factors. One set of genetic risk factors that impacts the prevalence of alcoholism on the islands and thus could influence clinical course is a unique distribution of alcohol-metabolizing genotypes that depend on ethnic heritage (*ADH1B**3, *ADH1C**2, and *ALDH1**2 alleles)

Received: November 6, 2007. Revision: May 12, 2008.

*This research was supported by National Institute on Alcohol Abuse and Alcoholism grants AA006420 and AA014370, the Stein Endowment Fund, and the University of the West Indies.

[†]Correspondence may be sent to Cindy L. Ehlers, Molecular and Integrative Neurosciences Department, The Scripps Research Institute, 10550 N. Torrey Pines Road, SP30-1501, La Jolla, CA 92037 or via email at: cindy@scripps.edu. Roma Joseph is with the San Fernando General Hospital, Trinidad and Tobago, West Indies. David A. Gilder is with the Molecular and Integrative Neurosciences Department, The Scripps Research Institute, La Jolla, CA. Helene Crooks is with the Scarborough General Hospital, Trinidad and Tobago, West Indies.

(Ehlers et al., 2007; Montane-Jaime et al., 2006; Moore et al., 2007a,b). Indo-Trinidadians possess a higher prevalence of the *ADH1C1*2* allele, which encodes a form of alcohol dehydrogenase that has reduced activity, is associated with heavy drinking, and has a higher risk of developing alcohol dependence (Montane-Jaime et al., 2006). Afro-Trinidadians and Tobagonians (TTs) have a greater presence of an allele (*ADH1B*3*), which has been associated with lower rates of alcoholism in that ethnic group (Ehlers et al., 2007). There are undoubtedly other genes that influence the risk for, or protection from, alcoholism in this population, but they currently remain undiscovered.

In addition to genetic factors, a host of yet unidentified environmental factors could also theoretically influence drinking practices in Indo-Trinidadians and Afro-TTs, such as drinking norms, price, availability, and religion. The drinking culture in Trinidad and Tobago has many similarities to practices in the United States; however, some practices that are perhaps unique theoretically could contribute to differences in the clinical course of alcohol-use disorders. One popular pastime called "liming" consists of the act of congregating and socializing with friends, usually in public places, and taking turns paying for a "round of drinks." Liming traditionally begins on a Friday night and continues throughout the weekend. Carnival and pre-Carnival represent a time of the year when heavy alcohol consumption is socially sanctioned. Alcohol is also present in many other social activities, including christenings, weddings, social parties, celebrations of birth, and funerals. Alcohol is also acceptable for sporting events (e.g., soccer [football] and cricket), with most of the major funding of these events being from alcohol-producing companies. In Trinidad, alcohol is also used for "medicinal" purposes and is still believed by many to be good for treatment of intestinal parasites. Traditionally, a cap full of rum is given to children, even below the age of 10, for this ailment. Brandy has also been mixed in milk to coax children to sleep or to help with the pain of "cutting teeth" or headaches.

The present study was designed to explore whether the course of alcoholism in Indo-Trinidadians and Afro-TTs follows the same patterns previously described in the literature for other ethnic groups or if it has its own distinct progression of events. Such information may be very useful in the identification of the events that lead to unique alcohol-related phenotypes, as well as their time of appearance. Additionally, these findings could lead to the design of effective early intervention programs that could abort certain sequences of events and thus theoretically forestall the development of alcohol dependence.

Method

This study was approved by the Ethics Committees of the Faculty of Medical Sciences, The University of the West In-

dies, San Fernando General Hospital, the Ministry of Health for Caura Hospital, Scarborough Hospital, and the Institutional Review Board at The Scripps Research Institute. All participants gave written informed consent before inclusion in the study. A total of 148 alcoholics of both Indo ($n = 103$) and Afro ($n = 45$) ancestry were included in the study. Ethnicity was classified as having three grandparents from one of the two ethnic groups. Patients were recruited from admissions to the Substance Abuse and Prevention Centre at Caura Hospital, San Fernando General Hospital, and Scarborough Hospital. The treatment center at Caura, where most of the patients were recruited, is a non-fee-paying institution (i.e., the patients do not pay for service). It is the only government treatment center in Trinidad and Tobago.

Published data derived from 478 alcohol-dependent subjects from the Collaborative Study on the Genetics of Alcoholism (COGA) were used for comparison with the TT sample. (Hereafter, "TT" without being preceeded by "Afro-" refers to the whole group of Trinidadians and Tobagonians.) In that study, 124 men and 50 women with alcohol dependence were originally selected as probands and were obtained from treatment centers at six sites across the United States. Seven hundred and forty-eight individuals also in the study were relatives of those probands. Of these 922 subjects, 478 individuals were alcoholics (317 men and 161 women), and 444 were drinking but not alcohol dependent (183 men and 261 women). Data from these 478 individuals with alcohol dependence, as presented in Schuckit et al. (1995), were used in the present analyses.

The present study used the same procedures as Schuckit et al. (1993, 1995, 2002) and Ehlers et al. (2004) to evaluate the course of alcoholism in Trinidad and Tobago. The 35 alcohol-related life events and the age at which they first occurred were recorded in the alcohol section of the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA), an instrument designed to assess physical, psychological, and social manifestations of alcoholism and related disorders (Bucholz et al., 1994). The Collaborative Group on the Genetics of Alcoholism has previously validated this instrument in the United States (Hesselbrock et al., 1999). Diagnosis of alcohol dependence/abuse was made by any one of the two consultant psychiatrists of our group (using the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised [DSM-III-R]; American Psychiatric Association, 1987) and was confirmed by review of the SSAGA by a third psychiatrist.

The comparative analysis of the age at first occurrence of the sequence of alcohol-related life events between the alcohol-dependent subjects of both ethnic groups was performed using Spearman's rank correlation (r_s). The same analysis was also performed to compare the total sample of 148 TT alcoholics (Afro-TTs and Indo-Trinidadians) with a sample of alcohol-dependent patients from the COGA study. Significance for this analysis was set at $p < .001$. An

analysis of how many individuals endorsed individual items and whether they differed based on ethnicity (Afro-TT vs Indo-Trinidadian) or country of origin (Trinidad/Tobago vs COGA) was evaluated using the chi-square test. The analyses of whether the age at first occurrence of each of the items differed based on ethnicity (Afro-TT vs Indo-Trinidadian) or country of origin (Trinidad/Tobago vs COGA) was evaluated using *t* tests. Demographic characteristics were compared using Fisher's exact test for dichotomous variables and analysis of variance for continuous variables. To control for multiple comparisons, a $p < .01$ was considered statistically significant for these sets of tests.

Results

One hundred and sixty-five Indo-Trinidadians and 87 Afro-TTs participated in this study. Of these, 103 Indo-Trinidadians and 45 Afro-TTs were in substance-abuse treatment and diagnosed with DSM-III-R alcohol dependence (patients). Table 1 compares the demographic and clinical characteristics of the Indo-Trinidadian and Afro-TT patients. Indo-Trinidadian patients did not significantly differ from Afro-TT patients on age, education, marital status, and economic status, but Indo-Trinidadian patients were less likely to be employed ($p < .001$).

Table 2 shows the pattern of appearance of the retrospective reports of the ages at first appearance of alcohol-related life events for all 148 alcohol-dependent TT patients. The mean age for the first report of such life experiences was nearly 26 years. Before age 30, signs of heavy drinking (morning drinking, drinking more than intended, when not intended, in hazardous situations, and binges [2 or more days of intoxication]) and interpersonal problems (objections and

problems with family and friends, loss of friends; arguments, physical fighting; little time to participate in nondrinking activities or important activities) were reported. During this period, they also began to acknowledge early signs of loss of control over alcohol use, endorsing events such as the use of rules for drinking. Initiation of more severe drinking practices that led to legal problems, such as arrest for alcohol-related behavior, was also found during this period.

More severe drinking patterns (having a strong desire for alcohol and having feelings of guilt, finding themselves unable to change drinking behavior despite wanting to quit several times, and having their job affected were all endorsed) were observed as the participants reached their 30s. Relationships were also more severely affected at this age. Legal problems were more prevalent, as were arrests for drunk driving. Between ages 32 and 35, they recognized themselves as excessive drinkers and recognized evidence of severe, long-term consequences of alcohol dependence, which includes withdrawal, shakes, psychological impairment, and use of alcohol despite the presence of health problems observed.

To determine if this pattern that characterized the entire population studied was similar in the individual ethnic groups, the age at first occurrence of the sequence of the 35 alcohol-related life events was compared between the alcohol-dependent subjects of the two ethnic groups using Spearman's rank correlation (r_s). Results showed that Indo-Trinidadians had a high degree of similarity to the Afro-TT sample in their clinical course ($r = .66$, $p < .0001$), and no event occurred at a significantly different age for these two ethnic groups.

The comparison of response rates on individual alcohol-related life events, between Indo-Trinidadian and Afro-TT

TABLE 1. Demographic characteristics comparing alcohol-dependent Indo-Trinidadians to alcohol-dependent Afro-Trinidadians and Tobagonians (TTs)

	Indo-Trinidadians (<i>n</i> = 100)		Afro-TTs (<i>n</i> = 43)		
Variable	Mean (SE)		Mean (SE)		<i>p</i>
Age	44.1 (0.7)		45.4 (1.2)		.364
Years of education	9.5 (0.4)		9.9 (0.5)		.518
	<i>n</i>	%	<i>n</i>	%	
Gender					.039
Male	86	86.0	42	97.7	
Female	14	14.0	1	2.3	
Employed					<.001†
No	41	41.0	5	11.6	
Yes	59	59.0	38	88.4	
Economic status ^a					.666
<\$20,000	91	94.8	42	97.7	
≥\$20,000	5	5.2	1	2.3	
Married					.567
No	63	63.0	30	69.8	
Yes	37	37.0	13	30.2	

Notes: The alcohol-dependent Indo-Trinidadian group versus the alcohol-dependent TT group was compared using Fisher's exact test for dichotomous variables and analysis of variance for continuous variables. ^aIn Trinidad and Tobago dollars.

[†] $p < .01$.

TABLE 2. Sequence of alcohol-related life events in 148 Trinidadian and Tobagonian (TT) alcoholic patients

Alcohol-related life event in temporal rank order	TT patients who experienced event		Age at which event first occurred (years) Mean (SD)	Significant difference between Indo-T and Afro-TT patients (item endorsement)	Significant difference between TT patients and subjects from COGA (item endorsement)	Significant difference between TT patients and subjects from COGA (age at onset)
	<i>n</i>	%				
Hitting others without fighting	35	23.6	25.81 (7.10)			TT > COGA
Drank when not intended	123	83.1	25.83 (7.70)			TT > COGA
Lost friends	49	33.1	26.18 (7.03)			
Physical fights	45	30.4	27.17 (8.03)		TT < COGA	TT > COGA
Tolerance	123	83.1	27.22 (7.45)	Indo-T > Afro-TT		TT > COGA
Drank more than intended	133	89.9	27.49 (8.14)			TT > COGA
Drank when in hazardous situations	92	62.2	27.52 (7.17)		TT < COGA	TT > COGA
Arguments	93	62.8	27.74 (8.72)			TT > COGA
Binges	95	64.2	27.96 (8.33)	Indo-T > Afro-TT	TT > COGA	TT > COGA
Arrested for alcohol-related behavior	23	15.5	28.19 (9.38)		TT < COGA	
Decreased important activities	96	64.9	28.44 (7.44)		TT > COGA	TT > COGA
Hit/threw things	61	41.2	28.54 (9.33)			TT > COGA
Objections from family and friends	127	85.8	28.66 (8.49)			TT > COGA
Problems with family and friends	91	61.5	28.75 (8.65)			TT > COGA
Used rules for drinking	61	41.2	28.86 (7.35)			TT > COGA
Little time for nondrinking activities	91	61.5	29.49 (7.69)		TT > COGA	TT > COGA
Morning drinking	94	63.5	29.71 (8.92)			TT > COGA
Unable to quit/cut down	86	58.1	30.33 (7.52)		TT > COGA	TT > COGA
Inability to change drinking behavior	84	56.8	30.49 (7.97)	Indo-T > Afro-TT	TT > COGA	TT > COGA
Interfered with work responsibilities	89	60.1	30.55 (7.43)		TT > COGA	TT > COGA
Strong desire for alcohol	61	41.2	30.56 (8.22)			TT > COGA
Guilt	121	81.8	30.58 (9.35)		TT > COGA	TT > COGA
Hit family members	46	31.1	30.67 (8.52)			TT > COGA
Wanted to quit ≥ 3 times	120	81.1	30.89 (8.47)			TT > COGA
Arrested for drunk driving	35	23.6	31.03 (9.89)			
Self-injured while drunk	66	44.6	31.29 (9.41)			TT > COGA
Blackouts	105	70.9	31.30 (9.52)	Indo-T > Afro-TT		TT > COGA
Problems with love relationships	85	57.4	31.79 (7.03)	Indo-T > Afro-TT		TT > COGA
Shakes	96	64.9	32.24 (9.79)	Indo-T > Afro-TT		TT > COGA
Considered self excessive drinker	103	69.6	32.24 (8.57)			TT > COGA
Problems at work/school	70	47.3	32.73 (7.70)			TT > COGA
Withdrawal	101	68.2	32.83 (9.49)	Indo-T > Afro-TT	TT > COGA	TT > COGA
Psychological impairment	95	64.2	33.46 (8.24)		TT > COGA	TT > COGA
Continued despite health problems	32	21.6	34.73 (7.02)			
Health problems occurred	75	50.7	34.80 (9.69)	Indo-T > Afro-TT	TT > COGA	

Notes: T = Trinidadian; COGA = Collaborative Study on the Genetics of Alcoholism.

participants, revealed that Indo-Trinidadians were significantly more likely to report binges ($\chi^2 = 6.59, p = .01$), inability to change drinking behavior ($\chi^2 = 9.49, p = .004$), tolerance ($\chi^2 = 9.31, p = .004$), problems in love relationships ($\chi^2 = 10.22, p = .002$), blackouts ($\chi^2 = 12.34, p = .001$), shakes ($\chi^2 = 7.24, p = .01$), withdrawal ($\chi^2 = 6.63, p = .01$), and appearance of health problems ($\chi^2 = 7.78, p = .007$) (see Table 2).

The retrospective reports of the sequence of 35 alcohol-related life events for TT alcohol-dependent individuals

versus those reported in a sample of alcohol-dependent patients from the COGA study are shown in Table 2. TTs had a high degree of similarity to the COGA sample in their clinical course ($r = .77, p < .0001$). However, although the two groups generally reported having experienced the same progression of events, TTs were found to develop alcohol-related life problems approximately 5 years later. Subjects in the Trinidad/Tobago study were also more likely than COGA patients to report a significantly later occurrence in age of

items that indexed heavy/severe drinking, such as morning drinking ($t = 3.74$, 352 df, $p = .0002$), drinking when not intended ($t = 4.67$, 457 df, $p < .0001$), drinking more than intended ($t = 6.14$, 557 df, $p < .0001$), drinking in hazardous situations ($t = 7.24$, 512 df, $p < .0001$), binges ($t = 3.12$, 308 df, $p = .0020$), self-injured while drunk ($t = 4.23$, 266 df, $p < .0001$), strong desire for alcohol ($t = 3.86$, 223 df, $p = .0001$), use of rules for drinking ($t = 3.80$, 244 df, $p = .0002$), considered self an excessive drinker ($t = 5.51$, 443 df, $p < .0001$), inability to change drinking behavior ($t = 4.26$, 259 df, $p < .0001$), as well as inability to quit/cut down ($t = 2.71$, 298 df, $p = .0071$), wanted to quit three or more times ($t = 5.24$, 483 df, $p < .0001$), decreased participation in important activities ($t = 3.36$, 303 df, $p = .0009$), interference with work responsibilities ($t = 6.27$, 299 df, $p < .0001$), problems at work/school ($t = 8.74$, 281 df, $p < .0001$), and feelings of guilt ($t = 4.26$, 427 df, $p < .0001$).

Similarly, interpersonal problems—such as objections from family and friends ($t = 4.12$, 490 df, $p < .0001$), problems with family and friends ($t = 4.26$, 396 df, $p < .0001$), arguments ($t = .02$, 429 df, $p < .0001$), little time to participate in nondrinking activities ($t = 4.48$, 311 df, $p < .0001$), problems in love relationships ($t = 5.42$, 324 df, $p < .0001$), physical fights ($t = 5.75$, 247 df, $p < .0001$), hitting others without fighting ($t = 3.12$, 122 df, $p = .0023$), hit/threw things ($t = 4.13$, 304 df, $p < .0001$), and hit family members ($t = 3.07$, 157 df, $p = .0025$)—were also reported to occur at a later age. Physical events, such as blackouts ($t = 7.20$, 433 df, $p < .0001$), and symptoms of dependence, such as tolerance ($t = 3.61$, 490 df, $p = .0003$), withdrawal ($t = 2.61$, 294 df, $p = .0095$), and psychological impairment ($t = 6.18$, 274 df, $p < .0001$), were also significantly different with respect to age at first appearance.

Comparison of response rates on individual alcohol-related life events between all TT participants and subjects from the COGA study revealed that TTs were significantly more likely to report inability to quit/cut down ($\chi^2 = 7.31$, $p = .01$), inability to change drinking behavior ($\chi^2 = 14.67$, $p < .0001$), binges ($\chi^2 = 12.31$, $p < .001$), little time for nondrinking activities ($\chi^2 = 7.59$, $p = .006$), decrease important activities ($\chi^2 = 16.05$, $p < .0001$), interference with work responsibilities ($\chi^2 = 8.74$, $p < .003$), feelings of guilt ($\chi^2 = 11.61$, $p < .0007$), shakes ($\chi^2 = 60.90$, $p < .00001$), withdrawal ($\chi^2 = 29.56$, $p < .0001$), occurrence of health problems ($\chi^2 = 97.10$, $p < .00001$), and psychological impairment ($\chi^2 = 24.42$, $p < .00001$). COGA subjects, however, were significantly more likely to report physical fights ($\chi^2 = 8.06$, $p < .01$), arrests for alcohol-related behavior ($\chi^2 = 7.29$, $p < .01$), and drinking while in a hazardous situation ($\chi^2 = 64.48$, $p < .00001$).

Discussion

Understanding of the clinical course of alcoholism has the potential to help in the identification of events that lead to unique alcohol-related phenotypes—as well as their time

of appearance—which, in turn, could lead to the design of effective early intervention programs (Ehlers et al., 2004; Schuckit et al., 1993, 1995, 2002). To our knowledge, the course of alcoholism in a Caribbean population, including that of Trinidad and Tobago, has not been previously reported. This article reports the course of alcoholism in the two major ethnic groups of Trinidad and Tobago, as well as compares those results with a large U.S. population of alcoholics. That a high degree of similarity was observed between the Indo-Trinidadian and Afro-TT sample of alcohol-dependent persons in their clinical course expands earlier findings from studies involving different subgroups in the U.S. population of alcoholics and also reinforces the findings by Ehlers et al. (2004) that this consistency also extends to individuals of different ethnic heritage.

However, several differences were found in the proportion of Indo-Trinidadian participants endorsing individual alcohol-related items when compared with Afro-TTs. Five different severity of drinking items were more commonly endorsed by Indo-Trinidadian than by Afro-TT alcoholics: (1) binges, (2) tolerance, (3) blackouts, (4) withdrawal, and (5) health consequences. The fact that Indo-Trinidadians seem to have more severe drinking problems is also confirmed by findings that they are more likely to have elevated liver enzymes (alkaline phosphatase) and to report drinking more often and more drinks per occasion than Afro-TTs (Montane-Jaime et al., 2006).

Causes of these higher levels of drinking and alcohol-dependence symptoms are not entirely known. However, the *ADH1C*2* allele has been significantly associated with alcohol dependence and Indo-Trinidadian ancestry (Montane-Jaime et al., 2006), but it was not associated with current or heaviest alcohol consumption levels. Individuals with at least one *ADH1C*2* allele have also been shown to have significantly elevated levels of gamma-glutamyl transferase (GGT), compared with individuals homozygous for *ADH1C*1*. Additionally, GGT levels were also found to be elevated within Indo-Trinidadian alcohol-dependent persons with at least one *ADH1C*2* allele but not within the Afro-TT alcohol-dependent persons with that allele. Finally, a linear regression that included alcohol dependence and levels of alcohol consumption confirmed that levels of serum GGT were significantly associated with the *ADH1C*2* genotype (Montane-Jaime et al., 2006). The influence of other genes on risk and protection from alcohol dependence in Afro-TTs and Indo-Trinidadians has not yet been evaluated.

Undoubtedly, a host of social and cultural factors that have not yet been formally studied also influence the use of alcohol on the islands. In one recent report, the influence of religious affiliation was studied in adolescents in Trinidad, Tobago, and St. Lucia. Hindu adolescents were found to have higher levels of regular alcohol use (Rollocks and Dass, 2007). In that study, there was no speculation on the reason that Hindu adolescents were more likely to use alcohol.

However, the religious affiliations practiced by Afro-TTs were more likely to prescribe abstinence from alcohol than those practiced by Indo-Trinidadians. Thus, religion may have an important influence on drinking practices on the islands.

A high degree of similarity in the clinical course between TT alcoholics and those from the COGA sample was also found. However, TT alcoholics were found to develop alcohol-related life problems approximately 5 years later, suggesting that progression to alcohol dependence is slower. Additionally, they also tended to experience more severe alcohol symptoms, such as drinking more excessively, failing to control their drinking activity or fulfilling family and work responsibilities, feeling guilty, and developing mental and long-term health problems. However, violent behavior was reported significantly more in COGA subjects, most likely because of the low rates of conduct and antisocial personality disorder seen in this treatment sample from Trinidad/Tobago (Shafe et al., in press). A high prevalence of substance-induced depression has been reported in both Indo-Trinidadian and Afro-TT alcoholics. These data suggest that the alcoholics seen in treatment in Trinidad and Tobago differ from those in the United States, in that they are less likely to have externalizing diagnoses but do have a severe form of alcoholism, as well as susceptibility to substance-induced depression.

The results of the present study confirm the consistency of the previously reported sequence of progression of major alcohol-related events across subgroups of alcoholics and expand it to individuals of Indo and Afro ancestry. The greater endorsement of binges, tolerance, blackouts, and withdrawal by Indo-Trinidadians can highlight the importance of these events in this population for the development of alcohol dependence. Progression to alcohol dependence seems to be slower in TT alcoholics than in the U.S. population of alcoholics represented in the COGA study, but severe alcohol symptoms are more commonly endorsed in TTs. With this in mind, effective early intervention programs addressed to halt these events could be designed to prevent the development of alcohol dependence and the development of long-term health complications in these individuals.

When interpreting these results, a number of methodological limitations must be considered. Reliance on retrospective reports can introduce some bias because responses are dependent on the patient's recollection of an event that occurred years ago. In addition, the number of Afro-TT alcoholics used in this comparison may not have been large enough for a sound conclusion, and comparisons with other large populations of alcoholics can be limited by differences in recruitment issues, as well as genetic and environmental variables. Despite these limitations, this article represents an important first step in an ongoing investigation to determine risk and protective factors associated with the development of substance-use disorders in these ethnic groups in Trinidad and Tobago.

Acknowledgments

The authors thank Linda Corey, Michelle Dixon, Phil Lau, Shirley Sanchez, Gina Stouffer, and Derek Wills for assistance in data collection and analysis and manuscript preparation.

References

- AMERICAN PSYCHIATRIC ASSOCIATION. Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R), Washington, DC, 1987.
- BUCHOLZ, K.K., CADORET, R., CLONINGER, C.R., DINWIDDIE, S.H., HESSELBROCK, V.M., NURNBERGER, J.I., JR., REICH, T., SCHMIDT, I., AND SCHUCKIT, M.A. A new, semi-structured psychiatric interview for use in genetic linkage studies: A report on the reliability of the SSAGA. *J. Stud. Alcohol* **55**: 149-158, 1994.
- CENTRAL STATISTICAL OFFICE. Population and Vital Statistics: Pocket Digest, Port of Spain, Trinidad and Tobago, West Indies: Central Statistical Office, Republic of Trinidad and Tobago, 2003.
- EHLERS, C.L., MONTANE-JAIME, K., MOORE, S., SHAFE, S., JOSEPH, R., AND CARR, L.G. Association of the ADH1B*3 allele with alcohol-related phenotypes in Trinidad. *Alcsm Clin. Exp. Res.* **31**: 216-220, 2007.
- EHLERS, C.L., WALL, T.L., BETANCOURT, M., AND GILDER, D.A. The clinical course of alcoholism in 243 Mission Indians. *Amer. J. Psychiat.* **161**: 1204-1210, 2004.
- HESSELBROCK, M.N., EASTON, C., BUCHOLZ, K.K., SCHUCKIT, M., AND HESSELBROCK, V. A validity study of the SSAGA—a comparison with the SCAN. *Addiction* **94**: 1361-1370, 1999.
- JELLINEK, E.M. Phases in the drinking history of alcoholics: Analysis of a survey conducted by the official organ of Alcoholics Anonymous. *Q. J. Stud. Alcohol* **7**: 1-88, 1946.
- MONTANE-JAIME, K., MOORE, S., SHAFE, S., JOSEPH, R., CROOKS, H., CARR, L., AND EHLERS, C.L. ADH1C*2 allele is associated with alcohol dependence and elevated liver enzymes in Trinidad and Tobago. *Alcohol* **39**: 81-86, 2006.
- MOORE, S., MONTANE-JAIME, L.K., CARR, L.G., AND EHLERS, C.L. Variations in alcohol-metabolizing enzymes in people of East Indian and African descent from Trinidad and Tobago. *Alcsm Res. Hlth* **30**: 28-30, 2007a.
- MOORE, S., MONTANE-JAIME, K., SHAFE, S., JOSEPH, R., CROOKS, H., CARR, L.G., AND EHLERS, C.L. Association of ALDH1 promoter polymorphisms with alcohol-related phenotypes in Trinidad and Tobago. *J. Stud. Alcohol Drugs* **68**: 192-196, 2007b.
- ROLLOCKS, S. AND DASS, N. Influence of religious affiliation in alcohol use among adolescents in Trinidad, Tobago, and St. Lucia: A follow-up study. *Amer. J. Drug Alcohol Abuse* **33**: 185-189, 2007.
- SCHUCKIT, M.A. (Ed.) *Drug and Alcohol Abuse: A Clinical Guide to Diagnosis and Treatment (Critical Issues in Psychiatry)*, 4th Edition, New York: Plenum Press, 1995.
- SCHUCKIT, M.A., ANTENELLI, R.M., BUCHOLZ, K.K., HESSELBROCK, V.M., AND TIPP, J. The time course of development of alcohol-related problems in men and women. *J. Stud. Alcohol* **56**: 218-225, 1995.
- SCHUCKIT, M.A., SMITH, T.L., ANTENELLI, R., AND IRWIN, M. Clinical course of alcoholism in 636 male inpatients. *Amer. J. Psychiat.* **150**: 786-792, 1993.
- SCHUCKIT, M.A., SMITH, T.L., DANKO, G.P., REICH, T., BUCHOLZ, K.K., AND BIERUT, L.J. Similarities in the clinical characteristics related to alcohol dependence in two populations. *Amer. J. Addict.* **11**: 1-9, 2002.
- SHAFE, S., GILDER, D.A., MONTANE-JAIME, L.K., JOSEPH, R., MOORE, S., CROOKS, H., RAMCHARAN, C., AND EHLERS, C.L. Co-morbidity of alcohol dependence and select affective and anxiety disorders among individuals of East Indian and African ancestry in Trinidad and Tobago. *West Indian Med. J.*, in press.