FETAL ALCOHOL SYNDROME (FAS) PRIMARY PREVENTION THROUGH FAS DIAGNOSIS: II. A COMPREHENSIVE PROFILE OF 80 BIRTH MOTHERS OF CHILDREN WITH FAS.

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Abstract -- A 5-year, FAS primary prevention study was conducted in Washington State to: 1) assess the feasibility of using a FAS Diagnostic and Prevention Clinic as a center for identifying and targeting primary prevention intervention to high-risk women, 2) generate a comprehensive, lifetime profile of these women and 3) identify factors that have enhanced and/or hindered their ability to achieve abstinence. The results of this study are presented in two parts. Objective 1 is summarized in Part I and is published separately. Objectives 2 and 3 are summarized in Part II below. Comprehensive interviews were conducted with 80 women, who had given birth to a child diagnosed with FAS, to document their sociodemographics, reproductive and family planning history, social and health care utilization patterns, adverse social experiences, social support network, alcohol use and treatment history, mental health and intelligence quotient. This high-risk population of women was diverse in racial, educational and economic background, was often victims of abuse and was challenged by mental health issues. Despite their rather harsh psychosocial profile, many demonstrated the ability to overcome their alcohol dependence over time. The women who had achieved abstinence had significantly higher I.Q.s, higher household incomes, larger more satisfactory social support networks, were more likely to report a religious affiliation and were more likely to be receiving mental health treatment for their mental health disorders relative to the women who had not achieved abstinence. The rate of unintended pregnancies and alcohol-exposed pregnancies was substantial. Key barriers to achieving effective family planning were maternal alcohol and drug use, lack of access to birth control and lack of support by their partner to use birth control. A FAS Diagnostic and Prevention Clinic can be used to identify women at high risk for producing children damaged by prenatal alcohol exposure. Primary prevention programs targeted to this population could lead to measurable reductions in the incidence of FAS.

INTRODUCTION

The fetal alcohol syndrome (FAS) is a permanent birth defect caused by maternal use of alcohol during pregnancy. FAS is characterized by pre- and/or postnatal growth deficiency, central nervous system dysfunction (CNS) and a unique cluster of minor facial anomalies (Clarren and Smith, 1978). Prevention of FAS requires targeting primary prevention interventions to women at highest risk to produce children damaged by prenatal alcohol exposure. FAS studies consistently report that women who have had one child with FAS, and who continue to drink, have progressively more severely affected children with subsequent pregnancies (May *et al*., 1983; Davis and Lipson, 1984; Abel, 1988).

Although women who have one affected child often have more, to date there is no anticipatory biologic or sociologic markers that distinguish the mothers of children with FAS from other women who drink in pregnancy and bear normal or nearly normal children. Treatment of women for alcoholism during pregnancy probably comes too late to prevent brain damage in affected fetuses even if the correct high-risk, alcoholic women are selected for therapy. While it would be ideal to identify and treat all alcoholic women prior to pregnancy, resources for such an effort are not available. However, each patient with FAS (as identified through a FAS diagnostic clinic) has a mother who has a proven ability to give birth to a child damaged by prenatal alcohol exposure. Focusing prevention efforts on this select and high-risk group of women could reduce the incidence of FAS births dramatically without overburdening the current health care and alcohol treatment system (Clarren and Astley, 1998).

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A Cooperative Agreement with the Centers for Disease Control and Prevention (CDC) from 1992 to 1997 allowed for the development of a FAS Diagnostic Clinic at the University of Washington to: (1) assess the feasibility of using a FAS Diagnostic Clinic as a center for identifying and targeting primary prevention intervention to high-risk women; (2) generate a comprehensive, lifetime profile of their birth mothers as a first step in the development of a FAS Primary Prevention Program targeted to meet their needs; (3) identify factors that have enhanced and/or hindered the birth mothers' ability to achieve abstinence.

The methods and outcomes of this FAS diagnostic and prevention project are presented in two parts. The first report presents the objectives and methodology for the entire project and summarizes the project's success at identifying high-risk birth mothers through the diagnosis of their children (Objective I). This second report presents a lifetime profile of 80 women who gave birth to a child with FAS and identifies factors that enhanced and hindered their ability to achieve abstinence and/or practice effective family planning (Objectives II and III).

METHODS

A detailed presentation of the methods is presented in Part I of this report (Astley et. Al, 2000). Briefly, the birth mothers of children with confirmed prenatal alcohol exposure and a diagnosis of FAS or static encephalopathy were identified retrospectively and prospectively through pediatric diagnostic clinics at the University of Washington and Children's Hospital and Regional Medical Center in Seattle, Washington.

These clinics included the University of Washington FAS Diagnostic Clinic established through this Cooperative Agreement (Clarren and Astley, 1997; Clarren et. al, 2000). The diagnosis of FAS or static encephalopathy/alcohol exposed was made using the clinical gestalt guidelines published by Sokol and Clarren (1989) or the 4-digit Diagnostic Code created by Astley and Clarren (1997, 1999, 2000). Women were eligible to enroll if they gave birth to at least one child with a diagnosis of FAS or static encephalopathy as described above. They could be of any age or race and had to be a resident of Washington State at the time of study enrollment. The women participated in a four-hour structured personal interview developed to generate a lifetime, comprehensive profile of her sociodemographics, reproductive and family planning history, social and health care utilization patterns, adverse social experiences, social support network, alcohol use and treatment history, mental health and intelligence quotient. The interview included 2,044 questions. The questions focused on three time periods in the women's lives: 1) at the birth of the index child with FAS, 2) at the time of the interview and 3) over their lifetime. This study was reviewed and approved by the University of Washington Human Subjects Review Board.

Analysis

t-tests and paired *t*-tests were used to compare outcomes between two independent or paired groups respectively when outcomes were measured on continuous scales. Chi-square tests and Fisher Exact tests were used to compare outcomes between two independent groups when outcomes were measured on nominal scales. Wilcoxon Signed Rank tests and McNemar tests were used to compare proportions between two independent or paired groups respectively, when outcomes were measured on ordinal scales.

RESULTS

Identification and Enrollment of Birth Mothers

A total of 257 women were identified as potentially eligible to enroll in this study. They had given birth to one or more children with confirmed exposure to alcohol and a gestalt diagnosis of FAS (Sokol and Clarren, 1989) or a 4-Digit diagnosis of FAS or static encephalopathy/alcohol exposed (Astley and Clarren, 1997, 1999, 2000). Of the 257 mothers, 92 were confirmed to be eligible to enroll in this study, 58 were confirmed to be ineligible and the eligibility of the remaining 107 remained unknown. Of the 92 mothers confirmed to be eligible, 80 (87%) were enrolled and interviewed. A more detailed summary of identification and enrollment can be found in Part I of this series (Astley *et al*., 2000).

Representativeness of the Maternal and Patient Study Populations

The maternal population that the FAS DPN clinics will target for primary prevention efforts are the birth mothers of children with FAS and static encephalopathy who can be identified and located with reasonable effort and live within Washington State where they are eligible to receive social and health care services. This target population is defined by the eligibility criteria presented above for this study. Eighty of the 92 women (87%) confirmed to be eligible to enroll in this study were enrolled and interviewed. A more detailed summary of the representativeness of this study population is presented in Part I of this series (Astley *et al*., 2000). Based on the percent of women interviewed (87%) and the profiles of the eligible women who did (n = 80) and did not enroll (n = 12), this study population is regarded as being highly representative of the target population.

Profile of the 80 Children whose Mothers were Enrolled.

A profile of the 80 children whose mothers were enrolled in the study is presented in Part I of this series (Astley *et al*., 2000). They were predominantly Caucasian, 7.8 years of age at the time of their diagnosis with over half no longer living with their birth mother at the time of the diagnosis. Eighty-nine percent had a gestalt or 4-Digit diagnosis of FAS or AFAS, the remaining 11% had a 4-Digit diagnosis of static encephalopathy/alcohol exposed without the full FAS facial phenotype. These were the diagnostic outcomes used to determine the birth mothers enrollment eligibility.

Maternal Sociodemographic and Mental Health Profile

A comprehensive, lifetime profile of the 80 birth mothers was generated documenting their sociodemographics, social and health care utilization patterns, adverse social experiences, social support networks and mental health (Tables 1, 2, 3 and 4). Due to the volume of data collected, only selected portions of this profile are presented in this report. Briefly, these women were on average 21 years of age at the birth of their first child, 27 years of age at the birth of the index child, 35 years of age at the diagnosis of the index child and 38 years of age at the time of study enrollment. The study population was predominantly Caucasian, closely resembling the racial distribution of Washington State with a slight over-sampling of Native Americans. Their children were on average 7.8 ± 5.9 (0.1 to 24.2) years of age at the time they were diagnosed. The average maternal I.Q. was 90.0 ± 15.2. Sixty-one percent did not complete high school; 25% had some college education. Fifty-nine percent had a gross annual household income of less than $10,000 at the time of the interview; 78% were in this income bracket at the time of the index child's birth. Ninety-five percent had been physically or sexually abused during their lifetime. Ninety-six percent had one to ten mental health disorders with the most prevalent being post traumatic stress disorder (77 %) and simple phobia (44%).

Maternal Lifetime Reproductive and Family Planning Histories

Their lifetime reproductive and family planning histories are presented in Tables 5 and 6. At the time of the interview, these women had given birth to 272 children. Seventy-three percent of each woman's live births were reportedly unplanned, 76% were reportedly exposed to alcohol. Mean parity and gravity at the time of the interview was 3.4 ± 1.6 and 4.4 ± 2.1 respectively. The mean parity of the index child was 2.6 ± 1.5. Thirty-five of these women went on to have 61 additional children after the birth of their index child. These 35 birth

Table 1. Selected sociodemographic characteristics of the 80 birth mothers

Characteristic	Mean	(S.D.)	Min. - Max.	*n*	Valid (%)
Age (years)					
At time of interview	37.5	(8.1)	23.1 - 55.4	80	
At diagnosis of index child	34.7	(7.3)	20.7 - 52.37	80	
At birth of index child	26.9	(5.6)	17.8 - 40.7	80	
At birth of first child	20.5	(4.1)	11.9 – 32.9	80	
Race/ethnicity					
Caucasian				54	(67.5)
African American				5	(6.3)
Native American/Canadian				20	(24.9)
Hispanic				1	(1.3)
Education: highest level completed (years)					
<9				18	(22.5)
9 - 11				31	(38.8)
12				11	(13.8)
13 +				20	(25.0)
mean	10.8	(2.8)	4 – 17	80	
Estimated IQ from Shipley (1967) Weschler Adult Intelligence Scale - R					
57 - 69				8	(11.1)
70 - 85				20	(27.8)
86 - 100				24	(33.3)
101 - 120				20	(27.8)
Mean	90.9	(15.2)	57 - 120	72	
Reported a religious affiliation				59	(73.7)
Marital status at birth of index child:					
Married / living with partner				50	(62.5)
Separated / divorced				13	(16.3)
Single, never married				17	(21.2)
Stability of housing at birth of index child:					
Permanent, stable				48	(60.0)
Living with friends or relatives				22	(27.4)
Transient, emergency shelters, homeless, jail, drug-free housing				10	(12.6)
Primary source of income at birth of index child:					
Public assistance, unemployment, social security				46	(57.7)
Husband or partner's employment				19	(23.8)
Her own employment				7	(8.7)
Parents, family or other support				8	(9.9)
Gross yearly household income at birth of index child					
Less than $10,000				62	(77.5)
$10,000 to $29,999				14	(17.5)
$30,000 to $69,999				4	(5.0)
Public assistance used at birth of index child (Can select > 1 choice)					
Medicaid/medical assistance				55	(69.6)
WIC				53	(67.1)
Aid for Families with Dependent Child./ welfare				51	(64.6)
Food stamps				50	(63.3)
Social Security Insurance				8	(10.2)

WIC,

Table 2. Maternal report of need for and access to social and health care services around the time of the index child's birth

	Needed Service		Had Sufficient Access To Service	
Characteristic	*n*	Valid (%)	*n*	Valid (%)
Medical care	77	(97.5)	65	(84.4)
Prenatal care	76	(96.2)	61	(80.3)
Medical insurance	75	(94.9)	61	(81.3)
Food donations or assistance	50	(63.3)	41	(82.0)
Childbirth or parenting classes	45	(57.0)	28	(62.2)
Birth control services	43	(54.4)	33	(76.7)
Public health nurse	40	(50.6)	34	(85.0)
Support groups (social, church group, etc.)	37	(46.8)	17	(45.9)
Emergency bill paying services	33	(41.8)	19	(57.6)
Clothing donations	32	(40.5)	26	(81.3)
Mental health services	30	(38.0)	12	(40.0)
Domestic violence services	28	(35.4)	7	(25.0)
Public housing	26	(32.9)	14	(53.8)
Legal assistance	25	(31.6)	10	(40.0)
Vocational classes or job training	19	(24.1)	7	(36.8)
Sexual assault services	8	(10.1)	4	(50.0)

mothers reported that 80% of the 61 children were unplanned and 75% were exposed to alcohol. Although the study did not include gathering include outcome data on these subsequent births, it was known that a least six of these children were diagnosed with FAS. The 80 women on average reported not using any form of birth control during most (81%) of their pregnancies. When asked what form of birth control they would prefer if it were available to them free of charge, the most preferred method was Depo Provera (31.6%) followed by Norplant (16.5%), tubal ligation (13.9%) and the pill (10.1%).

Maternal Lifetime Drug and Tobacco Use

Eighty-six percent of the women reported using illicit drugs at some time in their lives, 40% reported use around the time of the birth of the index child and 9% reported current use (around the time of the interview) (Table 7). The most common drugs used were marijuana, speed/amphetamines and cocaine/crack. Eighty-four percent of the women smoked tobacco around the time of the index child's birth.

Maternal Lifetime Alcohol Use and Treatment Histories

A large volume of data collected on alcohol use and treatment, brief summaries are presented in Tables 8 and 9. Briefly, these women were on average 15 years of age when they first started drinking, between 23 and 28 years of age when they were drinking maximally, 26 years of age when they first attempted to stop drinking and 27 years of age at the birth of the index child. They reported drinking on average nine fluid ounces (or 266 ml) of alcohol per drinking occasion just before the birth of the index child**.** Almost half of the women (47%) reported drinking daily at that time. While 84% reported

Table 3. Home placements and adverse experiences among the 80 birth mothers.

Characteristic	n	(valid %)
Had foster parents	19	(23.8)
Lived in a group home	14	(17.5)
Was ever in a juvenile detention facility	28	(35.0)
Involved in CPS as a child	18	(22.5)
Any of your birth children been in foster care or CPS	64	(80.0)
Sexually abused as a child (<17 yrs)	46	(57.5)
Physically abused as a child (<17 yrs)	37	(46.2)
Emotionally abused as a child (<17 yrs)	79	(98.8)
Sexually abused as an adult (≥17 yrs)	41	(51.3)
Physically abused as an adult (≥17 yrs).	68	(85.0)
Emotionally abused as an adult (≥17 yrs)	69	(86.3)
Sexually and/or physically abused at any time	76	(95.0)

Table 4. Mental health profile of the 80 birth mothers. .

Characteristic	mean	(S.D.)	min. - max.	n	(valid %)
Age (yrs) at onset					
Post-Traumatic Stress	18.9	(9.4)	2 - 41	61	(77.2)
Major Depressive Episode	18.1	(9.6)	3 - 38	47	(59.5)
Phobia – Simple	11.4	(10.5)	2 - 41	35	(44.3)
Phobia - Social	13.9	(7.7)	2 - 38	34	(43.0)
Antisocial Personality	14.2	(5.9)	4 - 30	31	(39.2)
Phobia - Agoraphobia	22.2	(10.3)	2 - 38	29	(36.7)
Generalized Anxiety Disorder	20.7	(10.1)	3 - 37	27	(34.2)
Manic Episode / Bipolar Disorder	18.5	(9.3)	5 - 36	17	(21.5)
Panic Disorder	21.0	(11.4)	4 - 39	16	(20.3)
Bulimia	22.0	(8.3)	7 - 39	10	(12.7)
Schizophrenia / Schizophreniform	20.7	(16.6)	5 - 38	3	(7.0)
Alcohol abuse	19.7	(6.2)	8 - 34	68	(86.1)
Number of women with multiple mental health disorders.					
0 disorders				3	(3.8)
1 disorder				3	(3.8)
2 - 4 disorders				33	(41.3)
5 - 7 disorders				26	(32.5)
8 - 10 disorders				12	(15.0)
Number of mental health disorders per woman		4.7	(2.5)	0 – 10	80
Number of women with mental health disorder(s) at time of interview		39	(48.8)		
Receiving mental health treatment at time of interview				30	(37.5)
Earliest age of onset of mental health disorder(s)					
Childhood (0-8 years old)				33	(44.6)
Adolescent (9-17 years old)				31	(41.9)
Adult (18+ years old)				10	(13.5)
Number of women for which onset of disorder preceded onset of alcohol abuse					
Post-Traumatic Stress				21	(40.4)
Major Depressive Episode				22	(52.4)
Phobia - Simple				23	(76.7)
Phobia - Social				23	(76.7)
Antisocial Personality				21	(70.0)
Phobia - Agoraphobia				7	(29.2)
Generalized Anxiety Disorder				9	(36.0)
Manic Episode / Bipolar Disorder				8	(53.3)
Panic Disorder				7	(43.8)
Bulimia				3	(42.9)
Schizophrenia / Schizophreniform				1	(50.0)

Number of women identified with mental health disorders on the Quick Diagnostic Interview Schedule, age at onset of the disorder and temporal relationship of onset of disorder to onset of alcoholism are given.

they felt they had a problem with alcohol use, 94% reported they did not want to reduce their use because it helped them cope, 72% did not want to reduce because they were in an abusive relationship, and 79% reported they were too depressed to do anything about it. The four most common reasons they did not seek alcohol treatment were they did not want to give up alcohol (87%), they were afraid they would lose their kids (42%), there was no one to take care of the kids (40%) and their partner did not want them to go to treatment (39%).

Of the 80 women interviewed, 41 reported they were abstinent by the time their child was diagnosed with FAS or static encephalopathy. Abstinence was defined as "consumes no alcohol or consumes minimal quantities only on special occasions". This is comparable to the definition of abstinence proposed by Cahalan (*et al*., 1969) "drinks less than once a year or does not drink alcoholic beverages". Fifty of the 80 women reported they were currently abstinent (at the time of the interview). They had made, on average, six concerted attempts to stop drinking. Of the 80 women, 37 (46.2%) were still at risk for producing another child damaged by alcohol exposure at the time of the index child's diagnosis by virtue of still being fertile and actively drinking or at risk for drinking.

Contrasts between Women Who had and had not Achieved Abstinence.

Contrasts between the 50 women who had achieved abstinence by the time of the interview and the 25 women who were not abstinence at this time point are presented in Table 10. The women who had achieved abstinence had, on average, significantly higher I.Q.s, higher household incomes, larger more satisfactory social support networks and were more likely to report a religious affiliation. While they were equally likely to have mental health disorders, those who had achieved abstinence were more likely to have received treatment for their mental health disorder(s). Those who had achieved abstinence reported higher levels of drinking just before the birth of the index child and were more likely to have parents who had problems with alcohol use. They were comparable in race, education, employment, adverse experiences such as physical/sexual/emotional abuse, age at the interview, age at first abstinence attempt, age at first pregnancy, age at birth of index child, and age when first started drinking.

Contrasts between a Woman's Most and Least Successful Abstinence Attempts

Women were asked an identical set of questions about alcohol use and treatment during what they believed was their least successful abstinence attempt, most successful abstinence attempt and the abstinence attempt closest to the birth of the index child. Of the 31 women who were abstinent at the time of the interview and reported a most and least successful abstinence attempt, the following were found to be significantly different between the two attempts. During their most successful attempt, they were on average six years older, more likely to be worried about the impact of their alcohol use on their health, receiving more support from their family, less likely to be employed, more likely to be dependent on public assistance for an income, more likely to be seeking treatment from an agency or person outside their home, more likely to have completed an inpatient program, more likely to have participated in an aftercare program, and more likely to attribute their success in stopping drinking to their desire/readiness to stop and their religious beliefs.

Table 5. Reproductive history of the 80 birth mothers.

Characteristic	Mean	(SD)	Min. - Max.	*n*	Valid (%)
Age (years) at first pregnancy	19.6	(3.8)	12.5 - 30.0	80	
Age (years) at first live birth	20.5	(4.1)	11.9 – 32.9	80	
Age (years) at birth of index child	26.9	(5.6)	17.8 - 40.7	80	
Per woman					
No. of unplanned pregnancies	3.3	(2.0)	0 - 9	80	
No. of unplanned live births	2.5	(1.7)	0 - 8	80	
No. of pregnancies with no birth control	3.5	(2.1)	0 - 9	80	
No. of pregnancies exposed to alcohol	3.0	(1.8)	0 - 8	80	
No. of live births exposed to alcohol	2.4	(1.3)	0 - 6	80	
Proportion of unplanned pregnancies	77.2	(29.2)	0 - 100	80	
Proportion of unplanned live births	73.3	(32.9)	0 - 100	80	
Proportion of pregnancies with no birth control	80.9	(27.6)	0 - 100	80	
Proportion of pregnancies exposed to alcohol	73.2	(30.6)	0 - 100	80	
Proportion of live births exposed to alcohol	75.9	(29.6)	0 - 100	80	
Parity at time of interview (Unit)	3.4	(1.6)	1 - 8	80	
Gravidity at time of interview (Unit)	4.4	(2.1)	1 - 9	80	
Parity of index child (Unit)	2.6	(1.5)	1 - 8	80	
Gravidity of index child (Unit)	3.3	(1.9)	1 - 9	80	
Total no. of children born to the 80 women at the time of the interview				272	
35 women gave birth to 61 children after the birth of the index child. Of these 61 children, the following numbers were:					
Exposed to alcohol.			46	(75)	
Conceived in the absence of birth control			73	(80)	
Diagnosed with FAS (outcomes of other 55 children unknown)			6	(--)	
No. of women who felt there was a time in her life when alcohol use put her at risk for getting pregnant			53	(66.3)	

Table 6. Family planning history of the 80 birth mothers.

Characteristic	Mean	(SD)	Used Method *n*	Used Method Valid (%)	Method failed *n*	Method failed Valid (%)
Number of women who had ever used the following types of birth control (Could select > 1 choice)						
No method			77	96.3		
Pills			71	88.8	22	31.9
Condoms			57	71.3	13	23.6
Abstinence			42	53.2	0	0.0
Tubal ligation			40	50.0	3	7.5
Withdrawal			25	31.6	8	32.0
Abortion			25	31.3	NA	NA
IUD			20	25.0	4	20.0
Vasectomy			18	22.5	1	5.6
Depo Provera			17	21.3	2	11.8
Diaphragm			14	17.5	3	21.4
Rhythm method			9	11.3	1	11.1
Norplant			7	8.8	0	0.0
Cervical cap			1	1.3	0	0.0
If birth control were available to you free of charge, which method would you prefer to use?						
Depo Provera					25	31.6
Norplant					13	16.5
Tubal ligation					11	13.9
Pills					8	10.1
No method					6	7.6
Condoms					5	6.3
IUD					3	3.8
Foam					3	3.8
Cervical cap					2	2.5
Vasectomy					2	2.5
Rhythm method					1	1.4
Diaphragm, Withdrawal, Abortion					0	0.0
Reasons why you did not use birth control services at some time (may select >1)						
Too involved with alcohol and drugs.					41	51.9
Experienced side-effects from using birth control in the past.					40	50.6
Could not afford it .					34	42.5
Did not have insurance coverage for it .					31	38.8
Partner did not want me to use it.					30	37.5
Had no place to go to get it .					17	21.3
Against my religious beliefs or felt it was wrong.					8	10.1
Age (years) when first started using birth control	18.8	(4.8)			80	

NA, not applicable.

Table 7. Lifetime drug and tobacco use of the 80 birth mothers.

Characteristic	n	(valid %)	n	(valid %)	n	(valid %)
			At time of		Around	
Drug Use		Ever	Interview		FAS Birth	
Alcohol	80	(100.0)	28	(35.0)	77	(96.3)
Marijuana	64	(80.0)	5	(6.3)	17	(21.3)
Speed/amphetamines	51	(63.8)	0	(0.0)	4	(5.0)
Cocaine/crack	50	(62.5)	2	(2.5)	12	(15.0)
Darvon/prescription pain killers	39	(48.8)	1	(1.3)	1	(1.3)
LSD	35	(43.8)	0	(0.0)	0	(0.0)
Valium/tranquilizers	31	(38.8)	0	(0.0)	2	(2.5)
Barbituates/sleeping pills	28	(35.0)	0	(0.0)	2	(2.5)
Inhalants	22	(27.5)	0	(0.0)	1	(1.3)
Heroin/opiates	18	(22.5)	0	(0.0)	6	(7.5)
PCP	16	(20.0)	0	(0.0)	0	(0.0)
Quaaludes	13	(16.3)	0	(0.0)	0	(0.0)
Methadone	9	(11.3)	1	(1.3)	2	(2.5)
Reported no drug use	7	(8.8)	71	(88.8)	47	(58.8)
Tobacco Use						
Ever smoked cigarettes	76	(95.0)	56	(70.0)	67	(84.0)

PCP, LSD?

Table 8. Alcohol use history of the 80 birth mothers

Characteristic	Mean	(SD)	Min. - Max.	*n*	Valid (%)
Mother's age (years)					
When she first started drinking alcohol?	15.1	(4.1)	7 - 30	80	
Range when she was drinking the most:					
Beginning of age range	22.9	(6.7)	10 - 41	78	
End of age range	28.0	(7.9)	14 - 53	75	
When she first tried to stop drinking?	25.8	(7.2)	14.4 - 47.1	74	
At birth of index child	26.9	(5.6)	17.8 - 40.7	80	
At start of most successful abstinence attempt	31.4	(6.8)	19.5 - 52.2	67	
At diagnosis of index child	34.7	(7.3)	20.7 - 52.4	80	
At time of interview	37.5	(8.1)	23.1 - 55.4	80	
Alcohol consumption just before pregnancy with index child					
Usual number of drinks per occasion	18.5	(19.2)	0.0 - 104.0	80	
Type of alcohol consumed most often:					
Wine				8	10.0
Beer				43	53.8
Liquor				21	26.2
Other				8	10.0
Frequency of drinking:					
Daily				35	43.8
Once to several times per week				24	30.0
Once every month or two		2.0		1	26.2
Highest no. of drinks consumed on a single occasion	28.5	(35.9)	3.0 – 26	0.0	73.0
Either birth parent ever had a problem with alcohol				63	78.8
Either grandparent ever had a problem with alcohol				51	63.8
Fertility and abstinence status of each woman at the time of index child's diagnosis					
Not fertile, not currently drinking				24	30.0
Not fertile, but drinking				19	23.8
Fertile, but not currently drinking				17	21.2
Fertile and drinking				20	25.0
Classification of alcohol use at time of interview					
Abstinent				47	62.7
Special occasions only				3	4.0
Social drinking				7	9.3
Problematic drinking				18	24.0
Unknown				5	(--)

[a] 1 drink = 0.5 fluid ounce = 14.8 ml absolute alcohol. Some interpreted 'occasion' to mean a multiple-day binge.

All other factors were comparable between their most and least successful sobriety attempts, including the amount and frequency they were drinking, whether or not they had a partner who was drinking, and the number of children they were caring for at the time.

DISCUSSION

The interviews revealed that this high-risk population of women was diverse in racial, educational and economic background, were often victims of abuse and were challenged by mental health issues. Despite their rather harsh psychosocial profile, many demonstrated the ability to overcome their alcohol dependence over time. Many descriptions of the female alcoholic population have appeared in the literature (Jarvis, 1992). Despite repeated attempts to capture the essence of the "female alcoholic personality syndrome" most have recognized the heterogeneity of the population (Beckman, 1984). In comparing our population to the published profiles of women alcoholics, we find many similarities and some interesting contrasts.

Mental Health

The co-occurrence of alcoholism with other mental health disorders has been widely recognized (Regier *et al*., 1990; Sheehan, 1993). In 1997, Kessler *et al* (1997) reported on patterns and correlates of psychiatric morbidity and co-morbidity based on data from the National Co-morbidity Survey, a nationally representative household survey of 8,098 men and women between 18 and 54 years of age. Interviews were conducted face-to-face with an 83% response rate. Diagnoses were made according to DSM-III-R using a modified version of the Composite International Diagnostic Interview (WHO, 1990). Lifetime co-occurrence of mental health disorders among the subset of 299 women with diagnoses of alcohol abuse were as follows: post traumatic stress disorder (10.5%), depression (30.1%), simple phobia (28.2%), social phobia (24.1%), antisocial personality (2.1%), agoraphobia (9.3%), generalized anxiety disorder (8.4%), mania (3.8%), and panic disorder (7.3%). The proportion of women with alcohol abuse who had a first onset of a disorder prior to the onset of her alcohol abuse were as follows: post traumatic stress disorder (10.5%), depression (30.1%), simple phobia (28.2%), social phobia (24.1%), antisocial personality (2.1%), agoraphobia (9.3%), generalized anxiety disorder (8.4%), mania (3.8%), and panic disorder (7.3%). Social phobia, simple phobia, depression and drug dependence were

Table 9. Alcohol treatment history of the 80 birth mothers

Characteristic	Mean	(SD)	Min. - Max.	*n*	Valid (%)
Duration of abstinence (years) at time of interview among those who were abstinent	4.6	(5.4)	0.0 - 22.1	50	
Ever felt she had a problem with alcohol				67	83.8
Ever tried to stop or reduce her drinking				75	93.8
Reasons for her not wanting to reduce her alcohol use					
Alcohol helped her cope with life's ups and downs				43	93.5
Too depressed to do anything about it				38	79.2
Was uncomfortable having a problem with alcohol				35	(74.5)
She was in an abusive or violent relationship				33	71.7
Did not think she had a problem				29	60.4
She did not think it would help				20	43.5
Boyfriend/husband/partner did not want her to				17	36.2
Family or friends did not want her to				9	19.6
Reasons that kept her from seeking alcohol treatment					
Did not want to give up alcohol				39	86.7
Was afraid her children would be taken away from her				18	41.9
Boyfriend/husband/partner did not want her to go				17	38.6
There was no one to take care of her kids				17	39.5
Had no money to pay for treatment				15	34.1
Had no insurance or medical care to pay for treatment				12	27.3
She heard bad things about treatment from friends				11	25.0
Was pregnant and afraid the baby would be taken away				11	25.6
Could not get into a program				11	25.0
Too far to travel, she had no transportation				9	20.5
Had a bad experience in past treatment				7	15.9
Was afraid of losing her housing				7	16.3
Family or friends did not want her to go				4	9.1
No. of concerted attempts to stop drinking among women who achieved abstinence at time of interview	6.3	(15.1)	1 - 100	50	
Most successful abstinence attempt (as reported by woman)					
First				13	19.4
Second				17	25.4
Third				17	25.4
Fourth - Tenth				20	25.0
Age (years) at start of most successful attempt	31.4	(6.8)	19.5 - 52.2	67	

highly predictive of subsequent development of alcohol abuse in Kessler's study population. In comparison, the prevalence of mental health disorders in our population of 80 women appeared to be much greater and more likely to precede the onset of their alcohol abuse (Table 4).

Physical/Sexual Abuse

Physical and sexual abuse is prevalent among alcoholic women. Covington (1982) reports that 12% to 53% of alcoholic women report incest or other childhood sexual abuse and up to 74% report some type of childhood or adult sexual abuse. Our study revealed childhood and/or adult sexual abuse occurred in 73% of the 80 women. Almost all (95%) were sexually and/or physically abused during their lifetime. Women who suffer from abuse may become increasingly depressed, anxious, and fearful of violence in their lives (Root, 1989). Root (1989) suggests that many women who relapse following substance abuse treatment are unable to cope with ongoing physical or sexual abuse without using alcohol or other drugs. She contends that substance abuse treatment personnel need to be familiar with the syndrome of domestic violence and abuse, because intervention will be unsuccessful if issues of past and current abuse are not addressed during substance abuse treatment. Beckman (1980) reports that alcoholic women were more likely to report that they felt powerless and inadequate compared to non-alcoholic women. She goes on to state that these findings support the contention that heavy alcohol consumption is a coping mechanism likely to be used by women to relieve feelings of helplessness and powerlessness (Beckman, 1984a). The use of alcohol and other drugs has become a way for women to deal with the emotional pain resulting from earlier abuse by someone close to them, someone they trusted (Covington and Surrey, 1997). Ninety-four percent of the women in our study reported that they did not want to reduce their alcohol use because '*alcohol helped her cope*'. Seventy-two percent reported they did not want to reduce their alcohol use because 'she was in an abusive relationship' or 'she was too depressed to do anything about it' (79%).

Social Support

Social support has often been reported in the literature as an important enabling factor for reduction of alcohol dependence. In a study of 400 Anglo alcoholics in treatment for alcoholism, Beckman, (1984a) reported that females who completed treatment were more likely to have greater social support for treatment entry. The 50 women who achieved abstinence in our study population reported having significantly larger, more satisfactory social support networks than the 25 women who failed to overcome their alcohol dependence.

Table 10. Selected contrasts between the 50 women who had achieved abstinence at the time of the interview and the 25 women who had not achieved abstinence.

	Abstinent at Time of Interview							
	Yes (n = 50)				No (n = 25)			
Characteristic	Mean	(SD)	*n*	Valid (%)	Mean	(SD)	*n*	Valid (%)
Most no. of drinks per occasion								
just before birth of index child**[a]	34.4	(42.4)	48		17.0	(9.6)	22	
Weschler Adult Intelligence Scale-R **	95.9	(13.9)	46		82.0	(12.3)	21	
Marital status at time of interview *								
Married/living with partner			26	52.0			11	44.0
Divorced			6	12.0			9	36.0
Other (widowed, never married)			18	36.0			5	20.0
*Gross yearly household income at interview**								
< US$ 10,000			25	50.0			19	76.0
US$ 10,000 +			25	50.0			6	24.0
Reported a religious affiliation *			36	72.0			11	44.0
Parents had a problem with alcohol use **			44	88.0			16	64.0
Social support network at the time of interview								
No. of support individuals **	17.2	(13.4)	50		11.1	(6.8)	25	
Level of satisfaction with support *[b]	5.4	(1.1)	50		4.7	(1.8)	25	
Mental health disorders								
Generalized Anxiety			16	32.0			11	45.8
Agoraphobia			16	32.0			11	45.8
Social phobia			22	44.0			11	45.8
Simple phobia			21	42.0			12	50.0
Post traumatic stress			38	76.0			19	79.2
Major depression			32	64.0			14	58.3
Mania/Bipolar			12	24.0			5	20.8
Bulimia			7	14.0			2	8.3
Antisocial personality			22	44.0			8	33.3
Number of mental health disorders per woman	5.0	(2.4)	50		4.7	(2.6)	25	
Receiving mental health treatment *			24	52.2			6	26.1

*P< 0.05; ** P< 0.01

[a] 1 drink = 14.8 ml absolute alcohol

[b] Six-point Likert scale (6=most satisfied)

Their social support networks included family, friends and service providers.

Alcohol Treatment

In 1992, a survey was conducted of 79 Seattle and King County non-profit and for-profit alcohol and drug treatment agencies to assess the availability of gender specific treatment for women (Seattle-King County Task Force for Chemically Dependent Women, 1993). The agencies reported 33% of their clientele were women of whom 73% were Caucasian, 14% were African American and 5% were Native American and 73% were between 21 and 40 years of age. Eighty-four percent of the providers did not provide on-site child care, 54% did not offer medical or mental health services at the agency site and 44% did not offer on-site recovery support groups like Alcoholics Anonymous. When the providers were asked what they believed to be the major obstacles for women securing treatment, the top three barriers reported were child-care, money and social stigma. These are certainly troubling statistics in light of the data collected in our study. Ninety-six percent of the 80 women had one or more mental health disorders and the women who received mental health treatment were significantly more likely to achieve abstinence than women with mental health disorders who did not receive treatment. Sixty to 70% of the 80 women reported they were taking care of one or more children during their reported abstinence attempts. Women who achieved abstinence were significantly more likely to participate in an aftercare program like Alcoholics Anonymous. Women who had failed to achieve abstinence had significantly lower incomes.

Beckman and Amano (1984) report that although the relative success of different types of alcoholism treatment has long been debated there is some evidence that treatment programs, regardless of their orientation, produce more positive and lasting outcomes than does doing nothing for the alcohol abuser. It is interesting to note that while 39 of the 50 women who achieved abstinence in our study reported seeking help outside their home during their most successful abstinence attempt, only 31 reported being admitted to an inpatient or/or outpatient program and only 26 reported completing the program(s). Beckman and Amano go on to report that to accept help for an alcohol-related problem, a person generally first must perceive the existence of the problem and be willing to attempt to control the problem. In our study, the women who achieved abstinence were significantly more likely to report concern for their health and a desire to want to stop drinking than the women who did not achieve abstinence.

Beckman and Amaro (1984) report that characteristics related to the individual that affect the person's ability to secure, and inclination to use, services include: 1) individual predisposing factors such as age and ethnicity; 2) attitudes and

beliefs regarding alcohol, treatment and health; 3) personal enabling traits such as personality characteristics and drinking and treatment history; and 4) social enabling characteristics such as child care responsibilities, social support systems and access to financial resources. The predisposing factors of age and ethnicity are immutable. Some mutable predisposing factors such as education and income may be changed through both policy and individual efforts, while other mutable predisposing factors such as religion or marital status, are more often changed through individual decisions (Beckman, 1984). In a study of moderately drinking women entering a program for drinking reduction (Walitzer and Connors, 1997), contrasts between the 120 women who completed the treatment with the 51 women who did not complete the program were comparable to the contrasts observed in our study (Table 10), despite the marked difference in the drinking levels of the two study populations. The moderately drinking women who did not complete treatment were significantly younger, more likely to have a racial background other than Caucasian, more likely to be single or divorced, had fewer years of education and reported more drinking per day at pretreatment relative to the women who did complete the program. Several factors that significantly differentiated the women who did and did not achieve abstinence in our study are potentially mutable (e.g., income, social support network and mental health treatment).

Family Planning

Avoiding alcohol use during pregnancy is just one of two ways to prevent FAS. The other is to prevent pregnancy during alcohol use. While the former reduces health risks to both mother and child, the later is purported by some to be the more simple and immediate means to an end. Both approaches are complex and resistant to change. While society might view the alcohol use and unintended pregnancies of these women as problems in their lives, these women often perceive their alcohol use and pregnancies as partial solutions to their problems. They report that alcohol helps them cope with their often abusive and impoverished lives. Pregnancy and children not only qualify them for social and health care services they might otherwise not receive, it also fulfills an innate desire to bear and raise children. Based on the data collected in this study, it would appear that the women were more successful at avoiding alcohol use than preventing pregnancy. This could be due, in part, to the astonishing lack of access women have to contraceptives. In 1987, 22 years after the U.S. Supreme Court affirmed the legality of contraceptive use in Griswold vs. Connecticut, 57% of pregnancies nationwide were unintended (Forrest, 1994). In 1993-94 new mothers in Washington State had approximately the same frequency of unintended pregnancies resulting in a live birth as the nation as a whole: 40% in Washington compared with 39% nationwide in 1988 (PRAMS, 1996; Brown and Eisenberg, 1995). The women in our study population reported that 78% of their first live born children were the result of unintended pregnancies; 60% of them were exposed to alcohol. There are many reasons why a woman does not practice effective birth control. One reason is access to affordable birth control. In a 1998 survey, conducted by the Office of the Insurance Commissioner, to determine the level of reproductive health benefit coverage in health insurance plans marketed in Washington State, 77% of the insurance plans paid for abortions while only 30% provided coverage for contraceptives. Worse yet, the percentage of individuals actually receiving coverage was lower; four out of five women do not have coverage for contraceptives (Senn, 1998). Lack of access to birth control was not the only reason that women in our study did not use birth control. They were equally likely to report that their alcohol and drug use interfered with their use of birth control and that their partners did not want them to use birth control. Only 10% reported they felt birth control was wrong or against their religious beliefs. In fact, 78 of the 80 women reported using some form of birth control during her life (diaphragm, IUD, cervical cap, pill, Depo Provera, Norplant, condoms, rhythm method or withdrawal) suggesting that few were opposed to birth control.

*Current Status of the Washington State FAS DPN Primary Prevention Prog*ram

The FAS DPN is currently working with the State to facilitate referral of high-risk women identified through the FAS DPN to appropriate primary prevention intervention services. Through this comprehensive approach to FAS diagnosis and prevention, we hope to measurably reduce the incidence of FAS in Washington State.

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