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FAS Behavioral Survey of Traits: Screening for Effects of Prenatal Exposure to Alcohol

Glena Andrews
George Fox University, gandrews@georgefox.edu

C. Joe Robins

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Screening for Behavioral Profile: Prenatal Exposure to Alcohol

Glena L. Andrews and C. Joe Robins

Northwest Nazarene University

Abstract

The FAS BeST was developed by parents and educators of children with Fetal Alcohol Syndrome rating behaviors characteristic of FASD including; easily influenced by others, difficulty learning from experience, appearing and declaring innocence even when confronted with evidence to the contrary, and experiencing difficulties in other domains. The FAS BeST differentiates between children with PEA, dysgenesis of the corpus callosum (DCC), and attention deficit hyperactivity disorder (ADHD; Porter & Andrews, 2004). The sample included 294 participants. Using the cutoff score suggested by Porter and Andrews (2004) the accuracy rates were 78% for FAS/E, 100% for controls, 85% for DCC, and 100% for ADHD. Reliability for the FASD BeST was established for all groups using split-half analysis. Criterion validity was verified using the *Achenbach* behavioral checklists (2002). A factor analysis indicated the FAS BeST denotes a general factor. The FAS BeST is a reliable and valid measure that is easily administered and scored. Children with PEA can be screened to determine whether further evaluation is warranted and differentiate between disorders with similar behaviors, enabling professionals to better serve the child and assist the care providers.

Screening for Behavioral Profile: Prenatal Exposure to Alcohol

Children with prenatal exposure to alcohol are often misdiagnosed especially if there are other issues at birth such as obvious physical abnormalities. Children with prenatal exposure to alcohol do not necessarily show withdrawal from alcohol at birth unless the mother is intoxicated at the time of delivery (Thomas & Riley, 1998). Symptoms of prenatal exposure to alcohol can be confused with various diagnoses at birth. According to the criteria listed in the International Classification of Diseases (WHO, 10th ed,), Fetal Alcohol syndrome (FAS) is listed under congenital malformations, deformations, and chromosomal abnormalities. In order to be diagnosed with FAS, a child must exhibit physical features such as small stature, low weight, microencephaly, facial features (e.g. flat philtrom, small upper lip), and some brain involvement such as developmental delays (Mutsvangwa et al. 2009)

The diagnosis of the full Fetal Alcohol Syndrome has met with some debate among professionals. Primarily the issue revolves around the necessity of the facial features being present for the diagnosis (Astley, Stachowiak, Clarren & Clausen, 2002; Gerberdling, Cordero & Floyd, 2004). These facial features do not always occur, sometimes are not prominent, or become much less apparent by adolescents. In addition, it is difficult to measure some of the physical manifestations in very small infants. The problem is the negative effect that prenatal exposure to alcohol has on the brain development independent of facial features.

Central nervous system dysfunction associated with prenatal exposure to alcohol manifests in a wide range of difficulties from mild cognitive dysfunction to complex neurobehavioral problems (Koren et al., 2003). These behavioral patterns are frequently associated with prenatal exposure to alcohol include: problems with attention, hyperactivity. inability to predict consequences, or from previous experience, “inappropriate or immature

behavior", inability to organize or plan, learning difficulties, poor abstract thinking, adaptability, judgment, and problems with speech development and overall communication (p. 1181). Additional research suggests children with FASD are more likely to have difficulty learning from experience, delaying gratification, interacting socially and inhibiting impulsive behaviors (Burd et al., 2003; Burgess, 1994).

Numerous studies (Khatchikian, 2001; Brown & Paul, 2000; Schieffer, 1999) have documented that persons who are born with agenesis or dysgenesis of the corpus callosum also exhibit a number of behaviors that are problematic, particularly within the social and personal domains. Nearly 7% of children with prenatal exposure to alcohol have dysgenesis of the corpus callosum. This is higher than for the general population (0.3%), and higher than the reported incidence of dysgenesis with other developmentally delayed groups (2.3%; Jeret & Serur, 1991).

The development of a behavioral phenotype for children with prenatal exposure to alcohol is important in addition to a tool that is easy to administer in order to screen for the behaviors. Although there are methods for diagnosing FAS, there are no standardized tools for screening possible cases of prenatal exposure to alcohol without the facial features. Nor are there tools that will differentiate behaviors unique to children with prenatal exposure to alcohol attention deficit hyperactivity disorder (ADHD) and dysgenesis of the corpus callosum (DCC). Because the anecdotal information from care providers of children with these diagnoses are similar, it is important to gather information that will differentiate the diagnoses in order to provide proper treatment. Porter and Andrews (2004) compared behavioral profiles using the *FAS BeST* (Waller, DeVries, Kenney & Andrews 2000) between controls with no mental or physical diagnoses, participants with DCC, and participants with FAS for fetal alcohol effects in age equivalent groups. The results supported the hypotheses that there are differences in the

behavioral phenotypes between children with prenatal exposure to alcohol, DCC, and ADHD. They found the *FAS BeST* detected differences between the behavioral patterns of people with an FASD, ACC and controls. The *FAS BeST* scores of the controls were significantly lower indicating fewer behavioral problems as reported by parents and/or care providers of these participants. The higher scores for participants with DCC suggested some overlap in behaviors between children and adolescents with DCC and FASD but with less severity when prenatal exposure to alcohol was not a factor.

Porter and Andrews (2005) concluded that based upon the initial analysis, the *FAS BeST* appeared to be a very useful screening tool for early detection of behavioral patterns that are more characteristic of prenatally exposed children than children with other disabilities, specifically DCC, ADHD. They suggested that the use of such a tool may allow for accurate detection and early intervention of possible behavioral problems that would interfere with a child's education and social development.

The current study sought to establish reliability and validity for the *Fetal Alcohol Syndrome Behavior Survey of Traits* (*FAS BeST*, Waller et al, 2000). The *FAS BeST* has the potential to be an easily administered and effective screening measure for children who have been prenatal exposed to alcohol and are experiencing difficulties in the social, behavioral, cognitive and emotional domains.

Method

Participants

The sample included 294 participants (141 females, 153 males, M age = 8.95 years). There were 7 controls (no mental or physical diagnoses, 5 females, 2 males). There were 226 in the DCC group (103 females, 123 males), 152 with a diagnosis of complete ACC, 64 with a

diagnosis of partial ACC, and 10 with a diagnosis of hypoplasia of the corpus callosum. The FASD group consisted of a total of 54 (31 females, 23 males), 38 with the FAS diagnosis and 16 with the FAE label. The FAE category included all participants with confirmed prenatal alcohol exposure without facial characteristics. Post hoc tests supported that there was no significant difference in age between diagnostic groups ($p > .05$).

Materials

Achenbach Behavioral Checklist. (Achenbach, 1991, 2002, 2007), Age appropriate forms of the behavior checklists were administered (1 ½-5, 6-18, & 18-59). These were completed by care providers. All forms consisted of questions asking about various internal and external behaviors that the person may be displaying.

Fetal Alcohol Syndrome Behavioral Survey of Traits. The *FAS BeST* consisted of 52 items that are rated on a Likert scale (0, 1, 2, 30. It was constructed by Ann Waller, Josie DeVries and Vicky McKinney of the Fetal Alcohol Syndrome Family Resource Institute (FAS*FRI). The items were developed from behaviors directly observed by professionals and caregivers who work with children and adolescents prenatally exposed to alcohol.

Demographics. A demographic questionnaire was used to obtain diagnostic age, gender, educational information, and birth mother's pregnancy information. Diagnostic categories were targeted to each participant group (i.e. complete ACC or FAS).

Results

Porter and Andrews (2004) suggested a cutoff score of 75 points on the *FAS BeST* to identify potential FASD. When this measure was used for the current data a hit rate of 78% for the FAS/E group, 100% for controls, 85% for the ACC group, and 100% for ADHD group was achieved.

Reliability

The reliability for the *FAS BeST* was evaluated using split-half analysis. An odd/even paired sample t-test indicated no significant difference in responses for persons with FAS/E t(39)=.434, p>.05; M even = 51.1, M odd = 51.5). Reliability was verified for persons with a diagnosis of ADHD (all types), t(5)=1.194, p>.05**;** M even = 20.33, M odd = 23.17). Persons diagnosed with DCC were variable in the reliability results. A top/bottom split for the group with complete ACC supported reliability (t(38)=1.31, p>.05; M top = 24.04, M bottom = 22.347. The odd/even split was significantly different (t(48)=5.596, p<.05; M even = 21.32; M odd = 25.06. Persons with partial ACC showed an opposite pattern with a significant difference between the top/bottom split (t(16)=2.358,p<.05; M even = 23.24, M odd = 30.82) but no significant difference for the odd/even split (t(16)=1.85, p>.05; M top = 31.4, M bottom = 27.6).

Validity

There is no significant difference on the FAS BeST total score between those with a diagnosis of FAS and those with FAE (t(51)=.626, p>.05; M = 96.76 & 91.06 respectively) A significant difference occurred for total *FAS BeST* scores between the diagnoses (F(4, 387) = 10.952, p<.05). Persons in the control and ADHD groups (M = 45.3) were significantly lower on the *FAS BeST* than the other groups. The persons in the ACC groups (all types) were significantly higher (M= 73.79) than the control group (M= 16.0). Those in the FAS/E group had the highest mean (95.04) which is significantly different than all groups.

Criterion validity was established using the *Achenbach* behavioral checklists (2002) versions for age groups 1.5-5, 6-18, and 18-59 years. There was a significant difference in the externalizing T score which parallels the difference in the *FAS BeST* score totals (F(4, 151)=22.498, p<.05). The means for the control group was the lowest (48.8), those in the

ADHD and ACC groups were slightly higher (M = 53.79, 54.5 respectively) and the FAS/E group had the highest mean (70.83).

Factor Analysis

A factor analysis of the *FAS BeST* indicated that all 50 core questions load on the first factor with coefficient values .5 and greater. The second factor had all but 1 item with coefficient values less than .5.

Discussion

The purpose of this study was to establish the reliability and validity of the *FAS BeST* and its effectiveness as a screening tool for evaluating a person with prenatal exposure to alcohol. Utilizing a cut off score of 75 as established by Porter and Andrews (2004), hit rates in agreement with independently established diagnoses were strong ranging from 78% to 100%. The *FAS BeST* is more likely to result in false negatives than false positives. Although any error in screening is less than desired, the *FAS BeST* performs well in differentiating behavior profiles between those with an FASD, DCC, and ADHD.

Reliability of the *FAS BeST* is strong for individuals with FAS/E and ADHD, but shows variability for those with ACC. The reasons were unclear, but reliability was established using the top/bottom comparison for this group.

Validity was demonstrated using the *Achenbach* behavioral checklists and comparing the *FAS BeST* scores from participants already diagnosed with FAS/E with those diagnosed with ACC, ADHD, and control participants. The results of these analyses show that the participants with FAS/E scored significantly higher on the *FAS BeST* than any of the other groups. *FAS BeST* scores compare with the externalizing T-score on the Achenbach. Externalizing behaviors including aggressive, acting-out, and rule-breaking types of behaviors. The *FAS BeST* includes

these types of behaviors that are characteristic of children with prenatal exposure to alcohol and additional characteristics that are not measured with the Achenbach, thus covering a broader range of problematic traits seen in children with an FASD.

The 50 core items of the FAS BeST represent a general factor or a behavioral phenotype. This measurement is not seen on other existing behavior rating scales. Thus the *FAS BeST* assists in establishing the likelihood of FAS or other caused diagnoses (e.g. ARND) using a global index.

Children with PEA struggle with a unique set of behaviors and thought patterns that overlap with other problematic conditions. Yet behaviors stemming from PEA are different enough from diagnoses such as DCC and ADHD to require different types of treatment, educational and parenting plans. Thus the detection of the FASD behavioral profile is imperative to proper treatment.

The *FAS BeST* was evaluated on participants spanning an age range from 3 years to 18 years of age. Recognizing that there are major normal developmental differences between children of this age span, adevelopmentally appropriate *FAS BeST* (Infant and Toddler BeST) is currently under study in order to further refine the screening process. In addition refinement of the *FAS BeST* is ongoing in order to expand the types of problem areas and diagnoses that are being investigated. Differences between adolescents with and those without PEA who commit crimes and are in the criminal justice system are being evaluated using the FAS BeST in order to better understand subtle difference in these populations and thus develop more effective corrective programs.

The FAS BeST is a reliable and valid measure that is easily administered and scored. Parents and care providers of children with known or suspected prenatal exposure to alcohol can

be screened in order to determine whether further evaluation is warranted for possible Fetal Alcohol Syndrome or other alcohol related diagnoses. Further the *FAS BeST* can differentiate between disorders with similar behaviors, thus enabling professionals to better serve the child and assist the care providers.

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