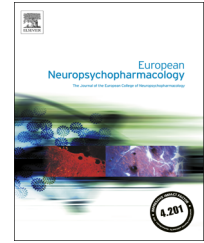




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Borderline intellectual functioning is associated with poor social functioning, increased rates of psychiatric diagnosis and drug use - A cross sectional population based study



Karny Gigi^b, Nomi Werbeloff^a, Shira Goldberg^a,
Shirly Portuguese^c, Abraham Reichenberg^d, Eyal Fruchter^c,
Mark Weiser^{a,b,*}

^aDepartment of Psychiatry, Sheba Medical Center, Tel Hashomer 52621, Israel

^bSackler School of Medicine, Tel Aviv University, Tel Aviv, Israel

^cDivision of Mental Health, Medical Corps, IDF, Israel

^dDepartment of Psychological Medicine, Institute of Psychiatry, London, England, United Kingdom

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Abstract

Borderline intellectual functioning is defined by the DSM IV as an IQ range that is between one to two standard deviations below the mean ($71 < IQ < 84$), and a considerable percentage of the population is included in this definition (approximately 13.5%). The few studies performed on this group indicate that borderline intellectual functioning is associated with various mental disorders, problems in everyday functioning, social disability and poor academic or occupational achievement. Using data from the Israeli military, we retrieved the social and clinical characteristics of 76,962 adolescents with borderline intellectual functioning and compared their social functioning, psychiatric diagnoses and drug abuse with those of 96,580 adolescents with average IQ (± 0.25 SD from population mean). The results demonstrated that the borderline intellectual functioning group had higher rates of poor social functioning compared to the control group (OR=1.9, 95% CI=1.85-1.94). Individuals with borderline intellectual functioning were 2.37 times more likely to have a psychiatric diagnosis (95% CI=2.30-2.45) and 1.2 times more likely to use drugs (95% CI=1.07-0.35) than those with average IQ. These results suggest that adolescents with borderline intellectual functioning are more likely to suffer from psychiatric disorders, poor social functioning and drug abuse than those with average

*Corresponding author at: Department of Psychiatry, Sheba Medical Center, Tel Hashomer 52621, Israel. Tel.: +972 52 666 6575; fax: +972 3 6358599.

E-mail address: mweiser@netvision.net.il (M. Weiser).

intelligence, and that borderline intellectual functioning is a marker of vulnerability to these poor outcomes.

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1. Introduction

Borderline Intellectual Functioning is defined by the DSM IV as an IQ range that is higher than that of “mental retardation” - between one to two standard deviations below the mean ($71 < IQ < 84$), encompassing 13.5% of the population. Few investigators have studied the impact of borderline intellectual functioning on psychiatric and social outcomes, partially due to the fear that such studies might have the unintended consequence of stigmatizing such individuals. Further, there are few population based databases that include IQ and such outcomes, and no longitudinal data regarding this vulnerability. Nonetheless, existing data support the association between borderline intellectual functioning and poor psychosocial outcome.

Hassiotis et al. (2008) examined data from the UK Wide Cross Sectional Survey of 8450 adults living in private households. They found that 12.3% of the sample had borderline intellectual functioning, and compared to their peers with average intelligence, this group had increased rates of neurotic disorders, depressive episodes, phobias, substance misuse and personality disorders, but not psychotic disorders. Further, this group was more likely to receive psychiatric medications and to utilize more community and daycare services. Seltzer et al. (2005) compared individuals with IQ scores of 85 or below with their siblings who obtained IQ scores above 100. They found that low-IQ individuals completed less schooling, had less prestigious occupations, rated themselves less physically healthy, and reported lower levels of psychological well-being.

Some studies indicate that low IQ is associated with risky health behaviors, such as alcohol abuse, and cigarette smoking (Kubicka et al., 2001; Chandola et al., 2006; Weiser et al., 2010). Other studies have demonstrated an association between low intelligence and delinquency in adolescence (White et al., 1989) and criminality or violence in adulthood (Huesmann et al., 2002). Finally, in a recent study, Hassiotis et al. (2011) demonstrated that participants with borderline intellectual functioning were more likely to report suicide attempts or self-harm compared to those with average intellectual functioning. However these associations were no longer significant after controlling for income and age.

In the current study we used a population-based dataset collected by the Israeli Draft Board of 16-17 year old men to identify a cohort of 76,962 with borderline intellectual functioning and 96,580 with average IQs. The analyses examined clinical and social characteristics (social functioning, psychiatric diagnosis and drug use) of subjects with borderline intellectual functioning compared to subjects with average IQ.

2. Experimental procedures

2.1. Draft board assessment

Israeli law requires that all adolescents between the ages of 16 and 17 undergo a pre-induction assessment to determine their intellectual,

medical, and psychiatric eligibility for military service. This assessment is compulsory and is administered to the entire unselected population of Israeli male adolescents. It includes individuals who are eligible for military service, as well as those who will ultimately be excluded from service for medical, psychiatric, or social reasons.

2.2. Cognitive assessment

The cognitive test battery yields a total score which is a highly valid measure of general intelligence, equivalent to a normally distributed IQ score. Tests are administered by a trained psychometrician. The cognitive assessment comprises four sub-tests: (a) Arithmetic-R, which assesses cognitive reasoning, concentration, and concept manipulation. This sub-test is similar to the ‘arithmetic’ sub-test from the Wechsler Intelligence Scales. The test is in a multiple-choice format and contains twice as many items, and therefore includes harder test items; (b) Verbal analogies which assess verbal abstraction and categorization (i.e. the ability to understand the relationship between words and the use of this relationship in several contexts). This is a multiple-choice test. This test is similar to the ‘similarities’ sub-test from the Wechsler Intelligence Scale. Unlike the Wechsler test, this sub-test is a multiple choice test and subjects are requested not only to identify and report the semantic of causal relationships between the test items, but also to apply these relations to target items; (c) A non-verbal spatial analogies test which measures non-verbal abstract reasoning and problem-solving abilities. This test is also a multiple-choice test; (d) OTIS-R, a modified, Otis-type verbal intelligence test adapted from the US Army Alpha Instructions Test, which measures the ability to understand and carry out verbal instructions (Lezak, 1995). Tests are progressive, beginning with relatively simple items and becoming more difficult. Tests are group-administered and are time-limited. All scores are based on the number of correct answers. In many validation studies conducted by the Draft Board, the summary score of the cognitive test battery has been found to be a highly valid measure of general intelligence (Gal, 1986)

2.3. Draft board psychiatric assessment

After the cognitive assessments are performed, a semi-structured, thirty minute, interview is held. The purpose of the interview is to assess personality and behavioral traits that will lead to an estimation of the potential conscript's suitability for military service, particularly service in combat units (Gal, 1986). The interview is administered by trained enlisted individuals (most of them female soldiers) who participated in a 3 month training course. The interviewers are under regular supervision by senior interviewers and participate in ongoing training. The behavioral assessment, administered only to males, includes a subscale assessing current social functioning. Based on structured questions, social functioning is then scored on a scale of 1-5: (1) Very poor: complete withdrawal, (2) Poor: weak interpersonal contacts, (3) Adequate: can form relationships with individuals and in a group, (4) Good: good interpersonal relationships and (5) Exceptional: superior interpersonal relatedness. The test-retest reliability of the behavioral assessment for inductees interviewed after several days by different interviewers is above 0.8, and population-based norms are available (Reeb, 1968; Gal, 1986). The draft board screening is described in detail in other reference (Gal, 1986).

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