



Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Behavioral inhibition and behavioral approach in young adults with very low birth weight – The Helsinki study of very low birth weight adults

Riikka Pyhälä^a, Katri Räikkönen^{a,*}, Anu-Katriina Pesonen^a, Kati Heinonen^a, Petteri Hovi^{b,c}, Johan G. Eriksson^{b,d}, Anna-Liisa Järvenpää^c, Sture Andersson^c, Eero Kajantie^{b,c}

^a Department of Psychology, University of Helsinki, P.O. Box 9, 00014 Helsinki, Finland

^b Department of Health Promotion and Chronic Disease Prevention, National Public Health Institute, Helsinki, Finland

^c Hospital for Children and Adolescents, Helsinki University Central Hospital, Helsinki, Finland

^d Department of General Practice and Primary Health Care, University of Helsinki, Helsinki, Finland

ARTICLE INFO

Article history:

Received 18 March 2008

Received in revised form 10 September 2008

Accepted 16 September 2008

Available online 26 October 2008

Keywords:

Very low birth weight

Prematurity

Personality

Behavioral inhibition

Behavioral approach

ABSTRACT

Susceptibility to emotional and behavioral problems that has been described among young adults with very low birth weight (VLBW ≤ 1500 g) may be affected by an individual's personality. However, little is known about the association between VLBW and personality in adulthood. The aim of this study was to test whether young adults with VLBW differ from those born at term in sensitivities of the behavioral inhibition system (BIS) and behavioral approach system (BAS).

We compared 164 VLBW young adults, of whom 54 were born small for gestational age (SGA, < -2 SD) and 110 appropriate for gestational age (AGA, -2 to $+2$ SD), with 172 term controls. Behavioral inhibition and behavioral approach were assessed with the BIS/BAS Scales. The VLBW participants scored lower than the controls on BAS-related fun seeking. Further, the VLBW-SGA women scored higher than the control women on behavioral inhibition and the VLBW-SGA men scored higher than the VLBW-AGA men on BAS-related drive. Results remained similar after adjustment for major confounders (age, body mass index and parental education). Our results indicate that perinatal conditions such as severely preterm birth and small birth weight for gestational age may be related to differences in adulthood personality.

© 2008 Elsevier Ltd. All rights reserved.

1. Introduction

The development of neonatal intensive care during the past few decades has resulted in improvements in the survival rate of pre-term infants with very low birth weight (VLBW; birth weight ≤ 1500 g). Regardless of the improved survival rates, accumulating evidence suggests that infants with VLBW may be at increased risk for compromised development as they grow up. For example, VLBW adolescents and young adults show more emotional and behavioral problems such as internalizing symptoms and social difficulties (Hack et al., 2004; Indredavik, Vik, Heyerdahl, Kulseng, & Brubakk, 2005). However, these data on the long-term mental health outcomes are not consistent, and appear to pertain to parent- rather than to self-reports.

Relative to the cognitive and mental health outcomes we know little about the personality traits that may make VLBW individuals vulnerable to less optimal development. There is some evidence that, when compared to term-born controls, VLBW children show

more difficult temperament characteristics, such as lower adaptability and more intense emotional expressiveness in infancy, weaker persistence in toddlerhood (Medoff-Cooper, 1986), and less rhythmicity in early childhood (Goldstein & Bracey, 1988). In adulthood, personality traits characteristic of those born prematurely include lower extraversion than in term-born controls (Allin et al., 2006). Further, the VLBW adults in our cohort differed from their peers born at term by showing higher conscientiousness, lower openness to experience, and also lower scores in excitement seeking, assertiveness, hostility and impulsivity (Pesonen et al., 2008). There is also evidence that adults with extremely low birth weight (< 1000 g) display more inhibitory behavior than their term peers (Schmidt, Miskovic, Boyle, & Saigal, 2008). While altered biological mechanisms may link prematurity and adverse behavioral outcomes, surprisingly little is known about the biologically based personality or temperamental traits of individuals with VLBW beyond the first years of life.

In this study, we explored the sensitivities of the behavioral inhibition system (BIS) and the behavioral approach system (BAS) (Gray, 1991) among young adults with VLBW and their controls born at term. Use of these constructs is reasonable because of their biological nature (Gray, 1991), although controversy exists on

* Corresponding author. Tel.: +358 9 19129501; fax: +358 9 19129521.

E-mail addresses: rpyhala@yahoo.com (R. Pyhälä), katri.raikkonen@helsinki.fi (K. Räikkönen).

whether they are conceptualized as constructs of temperament (Gray, 1991) or personality (Carver & White, 1994). Since temperament and personality have been used interchangeably to describe BIS and BAS as biologically based fundamental traits, defining them as one or the other may not be essential (Strelau, 1998).

Sensitivities of BIS and BAS are based on individual sensitivities to punishment and reward, respectively (Gray, 1991). For example, stronger BIS is related to anxiety and other internalizing symptoms and weaker BAS to lesser impulsivity (Segarra et al., 2007). Accordingly, we hypothesized that adults with VLBW would show more BIS sensitivity and less BAS sensitivity than the control group. Based on previous gender specific findings among VLBW survivors (Hack et al., 2004), we expected this effect to be shown in women in particular.

A relatively large proportion of the VLBW population has suffered from intrauterine growth restriction, which is reflected in being born small for gestational age (SGA), in contrast to appropriate for gestational age (AGA). We have previously demonstrated that VLBW-SGA adults are particularly vulnerable to depression (Räikkönen et al., 2008) and behavioral symptoms of attention-deficit/hyperactivity disorder (ADHD) (Strang-Karlsson et al., 2008). Thus, we additionally tested whether the effect of VLBW on BIS and BAS is modified by being born SGA or AGA. In accordance with our previous results, we expected those born SGA to show more BIS, but also more BAS. Further analyses were made to control for the effects of maternal smoking during pregnancy and pre-eclampsia, as they are common pregnancy-related risk factors associated with preterm birth and VLBW.

2. Method

2.1. Participants

2.1.1. VLBW group

The study cohort has been described in detail (Hovi et al., 2007; Räikkönen et al., 2008). The original study cohort consists of 335 VLBW infants who were born between 1978 and 1985, treated in the neonatal intensive care unit (NICU) of the Children's Hospital at Helsinki University Central Hospital in Finland and who survived until discharge (survival rate 70.7%). This unit serves the population of a specific geographical area (province of Uusimaa). When these former VLBW infants were young adults, we invited those 255 who were living in the greater Helsinki area to a clinical study and 166 (65.1%) of them participated. Perinatal and neonatal data for the participants and nonparticipants were similar, except for the lower rate of cerebral palsy among the VLBW participants (6% at 15 months of age, as compared with VLBW nonparticipants (19%, $p = 0.005$) (Hovi et al., 2007). Two of the participants did not return the personality questionnaire, leaving 164 VLBW adults of whom 70 (42.7%) were men. Their birth weights ranged between 600 and 1500 g, gestational ages between 24.0 and 35.6 weeks, and ages at testing from 18.5 to 27.0 years. Of the VLBW participants, 54 (32.9%) were born SGA (birth weight for gestational age ≤ -2 SD according to the Finnish birth weight charts (Pihkala, Hakala, Voutilainen, & Raivio, 1989)) and 110 (67.1%) appropriate for gestational age (AGA, birth weight for gestational age -2 to $+2$ SD). Within the VLBW-SGA and VLBW-AGA groups, 40.7% and 43.6% were men, respectively.

Within the VLBW group, those born SGA were more frequently born to mothers with pre-eclampsia (gestational blood pressure >140 mmHg systolic or >90 mmHg diastolic and urinary excretion of ≥ 0.3 g protein in a 24-h specimen, all after 20 weeks of gestation (National High Blood Pressure Education Program Working Group, 2000)) than those born AGA (42.6% vs. 10.9%, respectively, $\chi^2(1) = 21.7, p < 0.001$).

2.1.2. Control group

For each VLBW infant, we selected the next consecutive singleton infant with the same birth hospital, same sex, gestational age of 37 weeks or above and who was not SGA. Those 314 living in the greater Helsinki area were invited to clinical visits. The final control group consisted of 172 (54.8%) adults who agreed to participate; 69 (40.1%) of them were men. Control participants' birth weights ranged from 2560 to 4930 g, gestational ages at birth from 37.0 to 42.9 weeks, and ages at testing from 18.5 to 27.1 years.

Comparisons of the VLBW and control groups in neonatal, parental and adult characteristics are shown in Table 1. Every participant gave a written informed consent. The study protocol was approved by the Ethics Committee for Children and Adolescents' Diseases and Psychiatry at the Helsinki University Central Hospital.

2.2. Behavioral inhibition and behavioral approach in young adulthood

In conjunction with a clinical examination the VLBW young adults and term controls filled in the BIS/BAS Scales (Carver & White, 1994), which is a questionnaire pertaining to sensitivities of BIS and BAS (Gray, 1991). It consists of 20 items rated on a four point scale ranging from strongly disagree (1) to strongly agree (4). The items fall into four scales, one for BIS and three for BAS. Sensitivity to cues for punishment measures BIS (seven items, e.g. "I worry about making mistakes"), drive scale measures BAS-related tendency to persistently strive for appetitive goals (four items, e.g. "When I want something I usually go all-out to get it"), fun seeking measures BAS-related attraction for new potentially rewarding events and spontaneous eagerness to approach them (four items, e.g. "I'm always willing to try something new if I think it will be fun"), and reward responsiveness measures extent of BAS-related positive responses to occurred rewards or anticipation of such reward (five items, e.g. "When I'm doing well at something I love to keep at it"). The BIS/BAS Scales have good validity and reliability (Carver & White, 1994). In the present sample, the Cronbach's alpha reliabilities were 0.81 for the BIS scale, sensitivity to cues for punishment, and 0.80, 0.64 and 0.57 for the BAS scales, drive, fun seeking and reward responsiveness, respectively. These numbers were comparable to those reported in previous studies, although the alpha for reward responsiveness was relatively low. For example Carver and White (1994) reported alphas of 0.74, 0.76, 0.66 and 0.73 for sensitivity to cues for punishment, drive, fun seeking and reward responsiveness, respectively.

2.3. Statistical analysis and confounding factors

According to power calculations, at least 130 subjects per group would be needed to detect a 0.4 SD group difference with statistical power of 90% and a two-tailed significance level of 0.05. Between groups differences in BIS and BAS were examined using multiple linear regression analyses. Scales of sensitivity to cues for punishment, drive, fun seeking and reward responsiveness served, one at a time, as dependent variables and the VLBW versus control grouping together with major confounders as independent variables. Similarly, we compared VLBW participants born AGA and VLBW participants born SGA against the control group and against each other adjusting for the major confounders.

Major confounders included gender, BMI, age at testing and parental education as they may modify the associations between VLBW and BIS/BAS. In the current sample, women scored higher than men on sensitivity to cues for punishment ($B = 3.09, p < 0.001$), on reward responsiveness ($B = 0.58, p = 0.01$) and on drive ($B = 0.49, p = 0.04$). In addition, lower BMI was associated with higher sensitivity to cues for punishment ($B = -0.13,$

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات