Intelligence xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Intelligence

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

High intelligence: A risk factor for psychological and physiological overexcitabilities

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ARTICLE INFO

Keywords:
Intelligence
Psychoneuroimmunology
Depression
Anxiety
ADHD
Autism

ABSTRACT

High intelligence is touted as being predictive of positive outcomes including educational success and income level. However, little is known about the difficulties experienced among this population. Specifically, those with a high intellectual capacity (hyper brain) possess overexcitabilities in various domains that may predispose them to certain psychological disorders as well as physiological conditions involving elevated sensory, and altered immune and inflammatory responses (hyper body). The present study surveyed members of American Mensa, Ltd. (n = 3715) in order to explore psychoneuroimmunological (PNI) processes among those at or above the 98th percentile of intelligence. Participants were asked to self-report prevalence of both diagnosed and/or suspected mood and anxiety disorders, attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and physiological diseases that include environmental and food allergies, asthma, and autoimmune disease. High statistical significance and a remarkably high relative risk ratio of diagnoses for all examined conditions were confirmed among the Mensa group 2015 data when compared to the national average statistics. This implicates high IQ as being a potential risk factor for affective disorders, ADHD, ASD, and for increased incidence of disease related to immune dysregulation. Preliminary findings strongly support a hyper brain/hyper body association which may have substantial individual and societal implications and warrants further investigation to best identify and serve this at-risk population.

Intelligence quotient (IQ) is generally touted as a gift predicting exceptional outcomes in many domains including educational attainment and income level (Bergman, Corovic, Ferrer-Wreder, & Modig, 2014) and is a positive indicator of high system integrity (Gale, Hatch, Batty, & Deary, 2009; Gale, Batty, Tynelius, Deary, & Rasmussen, 2010; Gottfredson, 2004; Lubinski & Humphreys, 1992; Wraw, Deary, Gale, & Der, 2015; Wrulich et al., 2013). However, there are conflicting studies in the literature which point to an association between gifted IQ, particularly high verbal ability, and various mental and immunological outcomes such as depression (Jackson & Peterson, 2003; Wraw, Deary, Der, & Gale, 2016); bipolar disorder (Gale et al., 2013; MacCabe et al., 2010; Smith et al., 2015); anxiety disorders (Lancon et al., 2015); ADHD (Rommelse et al., 2016); allergies, asthma, and immune disorders (Benbow, 1985, 1986); and autism spectrum disorder (ASD) (Clark et al., 2016). These seemingly contradictory outcomes may be partially reconciled by taking a closer look at the field of psychoneuroimmunology (PNI) which examines the way in which the stress response to the environment, particularly that which is chronic and sustained, influences the communication between the brain and immune system (Ader, 2001).

This article extends the current literature on PNI and a variety of physiological and psychological disorders by assessing whether high intelligence may be linked to higher prevalence rates. This is a critical contribution, as research on intelligence and many disorders tends to focus on those with low intelligence to normal IQ scores, rather than extending to the upper ranges of the spectrum. To investigate these links, we assessed whether the prevalence rates in 2015 for those with high intelligence were higher than the reported national averages for mood disorders, anxiety disorders, ADHD, allergies, asthma, autoimmune diseases, and ASD. The connections between intellectual overexcitabilities and each of these conditions are discussed next.

1. Literature review

"A broader and deeper capacity to comprehend their surroundings" is a hallmark in one definition of intelligence agreed upon by fifty-two

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http://dx.doi.org/10.1016/j.intell.2017.09.001
Received 20 November 2016; Received in revised form 12 July 2017; Accepted 18 September 2017

notable researchers within the field of cognitive ability (Gottfredson, 1997). Those who are highly intelligent possess unique intensities and overexcitabilities which can be at once remarkable and disabling. For example, the same heightened awareness that inspires an intellectually gifted artist to create (Jauk, Benedek, Dunst, & Neubauer, 2013; Karwowski et al., 2016; Pässler, Beinicke, & Benedikt, 2015) can also potentially drive that same individual to withdraw into a deep depression (Jamison, 1993; Kyaga et al., 2011; Ludwig, 1992, 1995; Simonton & Song, 2009). It is hardly a new notion that unusually high rates of adult psychopathology are displayed among some of the most eminent geniuses (Jamison, 1993; Ludwig, 1992, 1995) with the poorest in mental health being among imaginative writers such as poets, novelists, and dramatists. The intensities leading to these psychological disorders were found to have manifested at a young age (Simonton & Song, 2009). Gere, Capps, Mitchell, and Grubbs (2009) gathered data on 6 to 11-year-old gifted students attending a public school gifted program and found that gifted children reacted with significantly heightened emotional and behavioral responses to their environment than did those of average intelligence. Due in part to this increased awareness, those with an overexcitable cognitive ability tend toward hyper-reactivity of the central nervous system (Chang & Kuo, 2013), which can lead to various other psychological and physiological consequences.

1.1. Intellectual overexcitabilities

Overexcitability (OE) is a term first introduced by Polish psychiatrist and psychologist, Kazimierz Dabrowski. He is most known for his theory of positive disintegration which came about by studying individuals with a high cognitive ability across their lifespans to understand their higher levels of emotional development (Dabrowski, 1964a, 1964b, 1966; Dąbrowski, 1976). His coined term is the English translation of the Polish word 'nadpobudliwosc' that originally means 'superstimulatability.' Dabrowski found these hyper-reactions and intensities to occur with greater frequency and of greater strength in the intellectually gifted compared to those with a normal or lower IQ. According to his clinical observations, bright individuals tended to be "neurotically allergic or nervous," a condition which he observed to be relatively absent in the intellectually delayed. They demonstrated a uniquely heightened way of experiencing and responding to their environment within five specific areas: psychomotor, sensory, intellectual, imaginational, and emotional domains. He found these overexcitabilities to be associated with personality development, and observed symptoms of slight neuroses among them as well, such as depression, mild anxiety, and tics (Mendaglio, 2008; Miller, Falk, & Huang, 2009).

1.2. Psychological overexcitabilities: Affective disorders and ADHD

Recent research agrees with Dabrowski and finds that an intense emotional response of individuals to their environment can lead to increased rumination and worry, both which have been associated with higher cognitive ability (Penney, Miedema, & Mazmanian, 2015). Rumination predicts chronicity of depressive disorders and anxiety symptoms including the new onsets of episodes (Nolen-Hoeksema, 2000). A highly ruminative cognitive style has been shown to be associated with increased vulnerability to major depression (Marchetti, Koster, Sonuga-Barke, & De Raedt, 2012; Nolen-Hoeksema, 2000) and contributes to symptom severity (Coplan et al., 2006, 2012; Kuehner & Weber, 1999)). Worry is the proposed cognitive process underlying general anxiety disorder (GAD) (American Psychiatric Association, 2013; Clark & Wells, 1995; Nolen-Hoeksema, 2000) and as with rumination, those who tend to worry more often and more severely, score higher on tests of intelligence. Penney et al. (2015) demonstrated that verbal intelligence in particular is a positive predictor of worry and rumination as well as being predictive of severity of both processes.

The presence of mood and anxiety disorders was found among other psychological conditions such as attention deficit/hyperactivity disorder (ADHD). In a longitudinal study by Michielsen et al. (2013), adults were assessed over a 6-year period for symptoms of ADHD, depression, and anxiety. The authors found that those with ADHD were at higher risk for both of these affective disorders. Further, Kessler et al. (2006) found that adults with ADHD often present co-occurring psychiatric conditions, including anxiety (47%) and mood (38%) disorders. Of note, those with high intelligence who experience psychomotor overexcitabilities in particular are those often diagnosed with ADHD due to the lack of general knowledge about this particular OE. This diagnosis oftentimes prevents individuals from being properly identified as having a gifted intellectual ability (Rommelse et al., 2016).

1.3. Physiological overexcitabilities: Psychoneuroimmunology

As the field of PNI grows and develops, many discrete pathways connecting psychology and immunity are being discovered (Ader, 2001). For highly intelligent individuals with overexcitabilities, even normal stimuli such as a clothing tag or a common but unnatural sound can become physically painful. Continuous seemingly minor insults such as these may mimic a low level, chronic stress which can eventually launch an inappropriate immune response. As with other environmental threats, like an infection or toxin, the body believes it is in danger. When the sympathetic nervous system becomes chronically activated, it finds itself in a continuous fight, flight, or freeze state, which triggers a series of changes in the brain and the body that can dysregulate immune function (Glaser et al., 1992; Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Padgett & Glaser, 2003). We are learning that stress has a significant effect on the ability of the immune system to protect us and consequences can take many forms including allergies, asthma, and autoimmune disease (Nasr, Altman, & Meltzer, 1981). While there is empirical evidence that mood disorders are associated with immune dysregulation, researchers have yielded conflicting results as to whether this dysregulation contributes to the pathophysiology of depressive disorders (Postal & Appenzeller, 2015; Young, Bruno, & Pomara, 2014) or whether depressive disorders increase susceptibility to immune-related disorders and health conditions such as infection, allergy and autoimmune diseases (Kronfol, 2002; Sansone & Sansone, 2011). Evidence for the latter is compelling given that altered immune function has been shown to be induced by chronically stressful stimuli in both human and animal models (Padgett & Glaser, 2003).

1.3.1. Allergies, asthma, and autoimmune disease

A combination of high intelligence and various allergies that begin in early childhood is not only a common stereotype, it is also verified in the scientific literature. In 1966, a significantly increased rate of allergies and asthma were reported at a school for gifted children (Hildreth, 1966). In a study of allergies and asthma in such children, 44% of those with an IQ over 160 suffered from allergies compared to 20% of age matched peers and 10% report having asthma (Rogers & Silverman, 1997; Silverman, 2002). Benbow (1986) conducted a study of over 400 highly mathematically and verbally talented students who were tested by the Scholastic Aptitude Test (SAT) to be in top 0.01% in reasoning ability. Among the students, she found that about half reported allergies, asthma, and other immune disorders compared to the expected prevalence of each disorder. She also found that parents and siblings of the students were more likely to suffer from these conditions than average-ability individuals (Benbow, 1985, 1986). Further, increased evidence of allergies, autoimmune disease, sensory sensitivity and high IQ has been found in a subset of individuals with ADHD (Chen et al., 2013; Cordeiro et al., 2011) and among those with autism spectrum disorder (ASD) (Gottfried, Bambini-Junior, Francis, Riesgo, & Savino, 2015; Lyall, Van de Water, Ashwood, & Hertz-Picciotto, 2015).