SSBP Syndrome Sheets

Rubinstein-Taybi Syndrome (RTS)

Prevalence

Although prevalence estimates have varied it is thought that the most accurate estimate is approximately 1 in 100,000 to 125,000 live births.

Genetics

Genetic markers are found in around 65-70% of cases and some individuals are diagnosed through clinical characteristics alone. RTS can be divided into two types: RTS1 and RTS2. These types are linked to heterozygous pathogenic changes or re-arrangements in the genes CREBBP and EP300, respectively. Both CREBBP and EP300 genes encode paralogous transcriptional coactivators with Lysine Acetyl Transferase Activity. CBP and p300 proteins are vital in initiating transcription. There are only a small number of reports of the clinical and behavioural features of RTS2, and these reports have indicated individuals are often more mildly affected, particularly in terms of the skeletal features and degree of intellectual disability.

Physical features

The physical characteristics associated with RTS have been well documented and include broad thumbs and toes, microcephaly, excessive hair growth and dental abnormalities (including narrow high-arched palate). The classical facial appearance changes with age. Descriptions in adults typically include low hanging columella, eyes with downward slanting palpebral fissures, long eyelashes, thick eyebrows, and a small mouth. Feeding problems are often present at birth, with descriptions of poor appetite, vomiting and failure to thrive during infancy, followed by enhanced appetite and weight gain in adolescence. Other health problems include renal abnormalities, constipation, recurrent upper respiratory infections, undescended testes in males and keloids.

Behavioural characteristics

Although still in its infancy, the literature outlining the behavioural phenotype of RTS is growing. In 2022, the literature was reviewed systematically, to describe the patterns of behaviour in RTS. The two most frequently noted characteristics relate to social behaviour and repetitive behaviour. Reports have described those with RTS as “overfriendly” and “happy” individuals who “love adult attention” and “know no strangers”. Such descriptions have led to the suggestion that individuals with RTS may show some enhanced, or preserved, social communication skills when compared to those with other causes of ID. Stereotyped behaviours such as rocking, spinning, and hand flapping, appear to be common. Other repetitive behaviours noted in around three quarters of individuals with RTS include an adherence to routine and an insistence on sameness.

Studies have also described sleeping difficulties, a tendency for individuals to be “emotional” and “excitable”, and “stubbornness”. The presence of ADHD-type behaviour, such as impulsivity and hyperactivity, has also been noted. Studies have commented on challenging behaviour in individuals with RTS, including aggressive behaviours and self-injurious behaviours, although evidence that these are more common in RTS than in ID generally is lacking.

Emotional Characteristics

Despite some studies showing social competency and social skills, other research has indicated that individuals with RTS demonstrate higher levels of social anxiety than those with Down syndrome across a range of social situations with both familiar and unfamiliar adults. Adolescents with RTS have been shown to be more likely to exhibit greater anxiety symptoms than infants and children with RTS. It has also been

suggested that individuals with RTS may be at increased risk of mood instability and emotional outbursts as they get older. More research is needed to explore the emotional and psychiatric characteristics of individuals with RTS.

Cognitive characteristics

Intellectual disability (ID) is an associated characteristic of RTS. Although estimates regarding the degree of ID have varied across studies, and there is a wide range of IQs within the syndrome, it is thought that most individuals lie within the moderate range. Genetics studies have started to link the molecular abnormalities to cognitive dysfunction in RTS. The CREB binding protein implicated in RTS has been shown to underlie long term memory formation and consequently it has been suggested that ID may be related to impaired long-term memory.

Preliminary work assessing social cognition in RTS indicates some 'precursor' social cognitive abilities are intact but there may be subsequent deficits in later developing Theory of Mind. In addition, there is emerging evidence that executive function abilities may be compromised in RTS relative to mental age and that these difficulties may be related to repetitive behaviours observed in the syndrome.

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The information contained in these syndrome sheets is aimed at clinicians, is for guidance only, and does not constitute a diagnostic tool. Many syndromes manifest in varying degrees of severity, and this information is not intended to inform patients of a specific prognosis.

The SSBP strongly recommends patients to follow the advice and direction of their clinical team, who will be most able to assess their individual situation