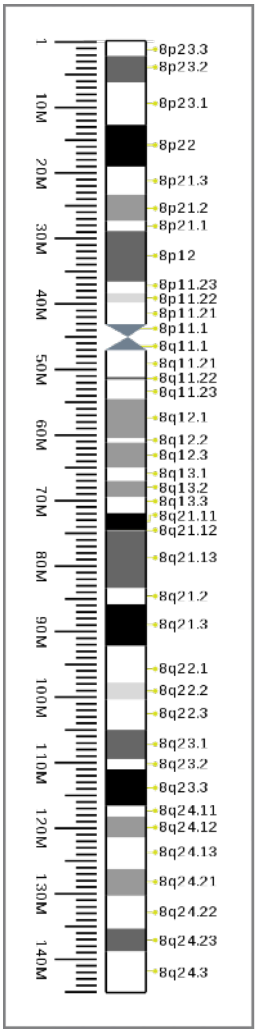
SAN LUIS VALLEY SYNDROME

SAN LUIS VALLEY SYNDROME (RECOMBINANT 8 SYNDROME)

A pericentric inversion is a rearrangement where a chromosomal segment containing the centromere is reversed end-to-end. The balanced carriers of such inversions are completely healthy, but their gametes (sperm or egg cells) may be abnormal due to unequal meiotic exchange between the inverted chromosome and its normal homologue.



As a result, the recombinant chromosome will have an excess of material on one arm (distal to the breakpoint) but without the all the genetic material on the other arm (proximal to the breakpoint). When a gamete with a recombinant chromosome is fertilized by a normal gamete from another partner, the embryo will be trisomic for one part of the chromosome and monosomic for another part of the same chromosome. The recombinant chromosomes, caused by pericentric inversions, are known for all other chromosomes, but only one type of such recombinants – recombinant chromosome 8 – is considered a specific syndrome: syndrome of recombinant 8 or San Luis Valley syndrome.

First identified in 1975, San Luis Valley syndrome is predominantly seen in persons of Hispanic descent - specifically individuals who have ancestors from the American Southwest[1]. The frequent occurrence of this condition in those with ancestors in this area of the Southwest creates the thought that these families may be somehow related. In the vast majority of cases, one parent of the patient has the pericentric inversion inv(8)(p23q22), but another parent has a normal karyotype. At the same time there are reports on sporadic occurrence of the recombinant chromosome[2]. All viable recombinants have trisomy for ~40 Mb segment 8q22-qter and monosomy for a 5-6 Mb segment of the short arm 8p23-pter. The opposite variant of

recombination (with trisomy for the short arm and deletion of the long arm of chromosome 8) has not been found: most likely such recombinants cause death of the embryo at the earliest stages of pregnancy.

Most patients are diagnosed postnatally due to the presence of several key features. This includes congenital defects of the heart and genitourinary system, distinctive facial dysmorphism, developmental delay and intellectual disability, and muscle tone abnormalities.

Almost all patients with San Luis Valley syndrome have congenital heart disease. This includes atrial septal defect, ventricular septal defect, pulmonary stenosis, tetralogy of Fallot, double outlet of the right outlet, and patent ductus arteriosus[3]. There are good reasons to consider heart defects as a result of the additional genetic material of the long arm of chromosome 8[4].

Many children with San Luis Valley syndrome also have genitourinary defects. This includes renal dysplasia with or without cysts, duplication of renal artery, ectopic kidneys, dilatation of collecting system, hydronephrosis, double collecting system, and fetal lobulation. There is no evidence, however, that these abnormalities impair renal function[1].

There are several distinctive facial features of children with San Luis Valley syndrome. This includes hypertelorism, frontal bossing, wide spaced teeth, elevated palate, abnormal hair whorl, and down-turned corners of the mouth[5].

Developmental and intellectual disabilities are common among individuals with San Luis Valley syndrome. Language and motor skill developmental milestones are clearly delayed[5]. Many children will have a speech delay and need speech or language therapy as a result[6]. Intellectually, individuals will range between mild and moderate levels of disability. However, they are typically able to maintain their social skills. These skills include things like social awareness, interpersonal thoughts, and nonverbal communication abilities. Patients can typically show shared enjoyment, maintain eye contact, and have a social smile when with others[3]. Individuals typically have abnormal muscle tone. Hyper-flexibility, hypertonic muscles, and hypertonic muscles are frequently seen[1].

Vital prognosis depends mostly on heart problems which are the main cause of death in the first years[3]. However, due to the evolution of modern medical practices there are many children who survive into adulthood.

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