Tuberous Sclerosis

Definition of Tuberous Sclerosis

Tuberous Sclerosis is a multi-system genetic disease in which there are tuber-like growths in the brain and other major organs. It is an autosomal dominant condition, although sporadic new mutations cause two thirds of cases, and is characterised by a triad of features: skin manifestations, intellectual disability and epilepsy. Virtually all cases arise from mutations in either the TSC1 or TSC2 genes, but other genetic and environmental factors may influence clinical severity. It occurs in fewer that 1 in 6000 children.

Presentation

Skin Lesions

- Ashleaf spots are irregular areas of depigmentation. These white patches can usually be detected in the first years of life. A Wood light will help to identify these especially in fair-skinned individuals and babies.
- There is a butterfly-like yellow-reddish nodular facial rash. These facial angiofibromas are wart-like lesions that tend to occur later and can be confused with acne.
- Shagreen patches (fibroepithelioma) are thickened yellowish areas of skin on the lower back.
- Subungual or periungual fibroma occurs under and around the fingernails and become more prevalent with age.

Intellectual Disability

About half of affected individuals will have an associated intellectual disability. There is a definite association between the severity of intellectual disability and the severity of epilepsy.

Seizures

Seizures have been reported in the majority of childhood cases but may be less frequent in adults. The first evidence of this disorder may be infantile spasms. Infantile spasms, complex partial and myoclonic seizures are the commonest types encountered. The seizure disorder is often difficult to control but may become less of a problem with age.
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Other Health and Behaviour Issues
- Cortical tubers are usually related to the severity of the epilepsy and intellectual disability.
- Subependymal hamartomas are markers for the disease but usually don’t have complications. The rare one can undergo malignant degeneration, especially giant cell astrocytoma.
- The renal cystic disease is indistinguishable from autosomal dominant polycystic kidney disease and may present in infancy. Renal angiomyolipomas tend to present after puberty.
- Rhabdomyomata of the heart may cause problems in the perinatal period. Growths can also occur in the eye, bone, lung and liver.
- Sleeping problems are common in children.
- Behavioural difficulties are common and include hyperactivity in 59%, aggressive behaviour in 13% and autism in 50%.
- Dental abnormalities such as multiple enamel pits are commonly found.

Management
- Genetic counselling for family including prenatal diagnosis options. The causative gene mutations can be found in up to 80% of cases.
- Treatment of cardiac failure and arrhythmias which occur in association with rhabdomyomata.
- Management of seizures including consideration of neurosurgery where cerebral hamartomas are causing severe focal epilepsy. Poor seizure control can restrict developmental progress.
- Treatment of cutaneous lesions by laser therapy, dermabrasion and cautery.
- Specific management of behaviour.
- Screening for hypertension.
- Regular dental care.
- Renal ultrasound every 5 years
- Syndrome-specific Conditions and Behavioural Phenotypes.
- Medication (side effects).

The material in this sheet has been adapted from the Therapeutic Guidelines book ‘Management Guidelines for People with Developmental and Intellectual Disabilities’ and updated from the 2005 version, Management Guidelines – Developmental Disability’ which can be consulted for more detailed information.

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