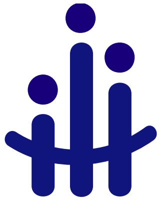

Clinical Guidelines for the Care of Patients with Tuberous Sclerosis Complex

A Summary

Initial Diagnosis

On initial diagnosis of a patient, your medical professionals may:

- Take a personal and family history
- Perform clinical examination including examination of the skin with a UV light
- Cranial Imaging – either by MRI or CT scan
- Renal (Kidney) ultrasound
- Echocardiography (non-invasive scan of the heart) and electrocardiography (ECG) in infants.
- Ensure that the diagnostic criteria (as detailed below) are satisfied

Diagnostic Criteria for Diagnosis of TSC

A definitive diagnosis of TSC requires 2 major features or 1 major and 2 minor features.

Major Features

- Facial angiofibromas or forehead plaque
- Ungual or periungual fibroma
- Shagreen patch
- Multiple retinal nodular hamartomas
- Cortical tuber
- Subependymal nodule
- Subependymal giant cell astrocytoma
- Cardiac rhabdomyoma – single or multiple
- Lymphangioleiomyomatosis and/or Renal Angiomyolipoma
- Hypomelanotic macules (more than three)

Suggestive Features which may require further investigation (minor features)

- Multiple randomly distributed pits in dental enamel
- Hamartomatous rectal polyps
- Bone cysts
- Cerebral white matter radial migration lines
- Gingival fibromas
- Non-renal harmatomas
- Retinal achromic patch
- “Confetti” skin lesions
- Multiple renal cysts
- Skin tags

Recommendations for Family Screening and Genetic Counselling

Any child of a person diagnosed as having TSC has a 50% chance of inheriting the condition. Family screening and genetic counseling should be carried out by referral to a clinical genetics service. The purpose is firstly, to discover if other family members have TSC and secondly, to quantify the risks for the parents and other family members of having children with TSC.

Gene testing for TSC is available through genetics services. Gene testing may be useful for family planning.

Investigate family members when indicated by:

- Family history
- Clinical examination including examination of skin with UV light and fundoscopy
- Brain CT or MRI
- The offer of genetic counselling

Evaluation and Monitoring

It is recommended that all individuals with TSC have a medical review at least once a year. This may be with a pediatrician, neurologist, clinical geneticist or in some cases, a family doctor.

The following management recommendations serve as a guide only. Management plans need to be tailored to the needs of the individual.

History and examination should ascertain whether current problems are under control or new ones arising.

It is recommended that the primary physician/s should investigate whether there are any problems that need attention, both at diagnosis and each follow-up visit, relating to:

- Epilepsy
- Neurological problems
- Cardiac symptoms
- Skin lesions
- Kidney complications
- Pulmonary problems in females of reproductive age
- Developmental and psychological problems

Recommendations for Epilepsy

- Review current seizures
- Review anti-epileptic medication
- Perform EEG if applicable

NEUROLOGICAL

If there is new and unexplained behaviour problems, mood changes, sleep disturbance or non-convulsive status:

- Perform urgent brain scan (MR preferred to CT)

CARDIAC

- ECG if symptoms of arrhythmia or in cases of unexplained loss of consciousness.

SKIN

- Consider treatment of facial angiofibromas and other skin lesions if necessary

KIDNEY

There are three possible main renal complications:

- Renal angiomyolipoma – symptoms from single or multiple AML's usually occur in adults.

- Renal cysts– single or multiple simple cysts occur in 20% of people with TSC. Polycystic kidney disease occurs in fewer than 5% of people. Rental function should be tested regularly in patients with PKD.

- Renal Cell Carcinoma – occurs in less than 1% of patients.

Monitoring of Renal Disease:

- Measure blood pressure annually
- Test renal function regularly if AML or PKD indicated
- Renal ultrasound 1-3 yearly. Refer to specialist clinic if haematuria or renal lesion occurs
- Solid renal lesions with a low fat content on ultrasound should be carefully investigated by an expert.

LUNGS

Pulmonary Problems in females of reproductive age

- Spirometry
- Chest x-ray
- High resolution CT
- It is recommended that female seek advice from a doctor with experience in TSC before commencing the oral contraceptive pill

DEVLOPMENTAL DISORDERS AND LEARNING DIFFICULTIES

General delay in development occurs in between 40-60% of individuals with TSC. The likelihood is greater in children who present with infantile spasms and difficult to control epilepsy.

People with a learning disability retain their capacity to learn well into their 30's and 40's so educational opportunities should continue after school age ends.

Recommendations for Developmental Assessment

- If developmental delay is suspected, assess intellectual and cognitive profile at key stages in order to identify problems early and act accordingly (age 2-3 and 7-8 years).

- Access specialist services for children and adults with learning disabilities and neuropsychological impairments, as required.

- Assess need for support from community learning disability teams.

PHYSCHOLOGICAL PROBLEMS

Learning difficulties frequently occur in conjunction with behavioural problems, but this need not always be so. Psychiatric and behavioural problems are amongst the most common difficulties found in TSC and often families find these disorders the most demanding on their resources.

Autism is reporting in around 25% of cases and pervasive developmental disorders in approx. 50%. Disruptive behaviour disorders characterized by hyperactivitiy and or attention deficits occur in 50-60%.

Sleep disturbances are very common and more likely if epilepsy is poorly controlled.

The treatment and management of the disturbances requires well co-ordinated multidisciplinary services. Prompt identification and early treatment has widespread benefits for the child and their family.

Recommendations for Psychiatric and Behavioural Disturbances

- Investigate for pervasive developmental disorders at age 2 years and again at school entry with an IQ test if developmental delay is suspected.

Screening for psychiatric and behavioural disturbances is required:

- At school entry
- Again at 7 years
- At secondary school transition
- During mid-adolescence (age 15 years)
- Refer to specialist mental health services if required