

## FSHD Fact Sheet

### **Pronunciation of FacioScapuloHumeral:**

fa-she-o-skap-y-lo-hum-er-al

### **The Founding of the FSHD Global Research Foundation Ltd**

The FSHD Global Research Foundation Ltd has solely been formed to fund medical research projects in Facio-Scapulo-Humeral Dystrophy (FSHD). These FSHD Research funded projects aim to create a better understanding of, find appropriate treatment and a cure for Facioscapulohumeral Dystrophy.

The FSHD Global Research Foundation aims to promote funding that will improve the quality of life for people and families suffering from this cruel and misunderstood disease. The FSHD Global Research Foundation aims to provide "HOPE" for FSHD people, their families and Doctors/Health Providers treating FSHD people.

### **Description of FSHD**

Facio-scapulo-humeral dystrophy (FSHD) is characterised by progressive muscle weakness and loss of skeletal muscles. It is an inheritable muscle disease, though up to one-third of the cases appear to be the result of de novo (new) mutations.

FSHD is the second most common form of Muscular Dystrophy seen in Adults and the third most common genetic disease seen in skeletal muscle yet there has been no focused research or funding for FSHD research in Australia and minimal funding overseas. FSHD Research is 20 years behind that of research into the most common form of Muscular Dystrophy. FSHD occurs in both males and females, and it can affect children and adults of all ages and all racial groups. The estimated incidence of FSHD in the general population is 1 in 15,000, yet it is difficult to calculate the exact incidence of FSHD due to misdiagnosis and lack of understanding and awareness of the disease and thus the incidence may be under reported. Current estimates have recently reported that 1 in 7,500 people affected. No appropriate research has been conducted to determine true estimates within the Australian population. There is no known treatment or cure for FSHD.

FSHD initially affects the skeletal muscles of the face (facio), scapula (scapulo) and upper arms (humeral) and is the origin of the name. These symptoms are often the basis of the physician's diagnosis of FSHD. Unfortunately FSHD does not just only affect these muscles but can also progress and spread to the foot, hip girdle, abdomen and other areas of the body and can have a drastic effect on a person's ability to walk.

Symptoms may develop in early childhood and are usually noticeable in the teenage years with 95% of affected individuals manifesting disease by age 20. In c. 5%-10% of FSHD cases a young child or an infant can develop symptoms in their first two years of life and these symptoms are usually more severe than symptoms seen in patients with later onset.

## **FSHD Fact Sheet (cont)**

The patient may notice early weaknesses of the muscles of the eye (open and close) and mouth (smile, whistle). Some people with FSHD may lose the ability to raise their arms above their head or to face level due to the progressive weakness in the muscles that stabilize the scapulae (shoulder blades). Some may lose the ability to show any facial expressions and experience serious speech impediments.

The progression of FSHD is quite variable, yet tends to be slow. Muscle weakness in FSHD can present asymmetrically meaning that weakness can differ between the left and right side of the body. Sometimes this difference in weakness can be quite striking. The reason for this asymmetry is unknown and is a unique characteristic to FSHD as compared to other dystrophies.

Other symptoms can be found in FSHD such as abnormalities of the blood vessels in the back of the eye. It is estimated that these abnormalities can lead to visual problems in only 1% of cases. Most patients can have these changes in the blood vessels but experience no visual problems. Researchers have questioned whether there might be similar changes in the blood vessels in the muscles. High-frequency hearing loss can sometimes also be seen. These eye and hearing symptoms are not in themselves a sufficient diagnosis for FSHD. More research is needed to address the understanding of these abnormalities seen in FSHD.

### **Predicting the Course and Outcome of FSHD**

The degree of severity and symptoms for FSHD patients can vary greatly ranging from asymptomatic individuals with minimal symptoms to patients who are wheelchair bound. There have been cases where some people with FSHD do not even know that they have it.

There is now a DNA genetic test performed by looking at the patient's blood and detecting deletion of the 4q35 Chromosome. It is considered 98% reliable for many cases where diagnosis of FSHD is uncertain or impossible. The most disturbing news for a person who has been diagnosed with FSHD is that while there is a basic understanding of FSHD there is much information that is unknown. The pathophysiology of FSHD is still unknown.

There is certainty that some muscles will become weak and waste away throughout life. This will indirectly affect the person's social, personal and occupational activities as they age. FSHD does not affect the person's intellect and as a group, FSHD people are well adjusted, motivated and educated. On average those with FSHD have a normal life span yet there have been some cases where it has reduced the person's life span due to secondary complications that have arisen from the primary muscle wastage. More research is needed to monitor patient risk.

The uncertainties of FSHD are that the rapidity and extent of muscle loss differ considerably among FSHD patients. The difference can also be seen within same family members who have the same genetic deletion defect. Some patients find that they have few difficulties throughout life while many may eventually find walking too difficult or impossible and may have to use or be confined to a wheelchair.

## **FSHD Fact Sheet (cont)**

In c. 5%-10% of FSHD cases a young child or an infant can develop symptoms in their first two years of life and these symptoms are usually more severe than symptoms seen in patients with later onset. This infantile form of FSHD presents earlier facial weakness during the first two years of life, typical muscle wastage of FSHD with some of these children experiencing early hearing losses and retinal abnormalities.

### **The Genetics of FSHD**

FSHD is inherited as an autosomal dominant disease. The son or daughter of an affected person is at 50% risk of inheriting the defective gene and prenatal testing is available.

The genetic cause of FSHD was first identified over 15 years ago. It was found that 95% of people affected by FSHD have a decreased number of D4Z4 repeats on chromosome 4q35. While the discovery of this chromosomal defect in FSHD was a huge success for FSHD research, unfortunately the gene(s) causing the disease has still not been identified. Once scientists can identify the gene(s) responsible for producing FSHD much valuable information and therapies will be unlocked.

Unlike other forms of dystrophy the D4Z4 deletion found in FSHD does not appear to affect genes that are known to be critical for skeletal muscle function or structure. Individuals appear to require the existence of 11 or fewer repeat units to be at risk for FSHD. International researchers have found that when the entire region where the FSHD deletion occurs is removed, there are birth defects, but no specific defects on skeletal muscle. This has forced scientists to question the possibility of FSHD having a position effect. There is much FSHD research to be done to understand these findings.

FSHD is a very difficult disease to figure out in terms of what is going on and research has been hampered due to lack of funding for FSHD research and thus a lack of interest from researchers. The FSHD Global Research Foundation's major aim is to rectify this problem.