Case report

Otorhinolaryngologic manifestation of Smith–Magenis syndrome

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Abstract

Smith–Magenis syndrome (SMS) is a multiple congenital anomaly/mental retardation (MCA/MR) syndrome link to a contiguous-gene deletion syndrome, involving chromosome 17p11.2, whose incidence is estimated to be 1:25,000 livebirth. SMS is characterised by a specific physical, behavioural and developmental pattern. The main clinical features consist of a broad flat midface with brachycephaly, broad nasal bridge, brachydactyly, speech delay, hoarse deep voice and peripheral neuropathy. Behavioural abnormalities include hypermotility, self-mutilation and sleep disturbance. This report defines the otorhinolaryngological aspects of a new case of SMS, confirmed by cytogenetic-molecular analysis, in a 9 year old girl affected by chronic otitis media, deafness and sinusitis, who presented with typical clinical signs and symptoms. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction

We describe here a case report of a girl, 9 years, 6 months old. We saw for ENT and pneumological evaluation because of chronic purulent otitis and recurrent respiratory infections. A multidisciplinary and depth approach lead to the correct diagnosis of Smith–Magenis syndrome (SMS).

1.1. Case report

SG, female, was the first born of a couple of healthy, unrelated parents. Family history is unremarkable as regards genetic disease. Pregnancy was normal and an ultrasound foetal examination
was with normal results. She was born at term through eutocic delivery.

Her physical growth was normal while her psychomotor development was mildly delayed. From a paediatric point of view she presented pneumonia at 6 months, needing hospitalisation. From the first years of life she suffered from recurrent otitis media and recurrent infections of high and lower respiratory tract. At 9 years, 6 months she underwent a specialistic otorhinolaryngoliatric (ENT) evaluation.

1.2. ENT evaluation

The following ENT investigations were performed; bilateral otoscopy (with otomicroscope); anterior rhinoscopy; flexible endoscopy; routine audiometric testing; air conduction thresholds from 250 to 4000 Hz; monitored live voice speech receptions thresholds and speech discrimination testing with use of word list according to Bocca [3]. Auditory Brain-stem Responses (ABR), mucociliary clearance by saccharin-charcoal method, ear and paranasal CT scanning.

The patient shows a bilateral chronic otitis media with effusion (OME) with an audiometric pattern of both conductive hearing loss and cochlear lesion. Sensorineural hearing loss was most pronounced for high-frequency tones and was due to pathology at the level of the cochlea; a retro-cochlear defect was absent with normal qualitative aspects of the ABR including interwave intervals and morphology, peak latencies and interaural latency differences. About the possible genetic origin of hearing loss we can not exclude it; in some syndromes both unilateral and bilateral losses may be found and may well represent the variable expressivity of certain autosomal entities. The nasal endoscopy shows middle meatal nasal secretions, medial bulging of uncinate process, mucosal thickening without polyps, adenoids hypertrophy with Eustachian tube obstruction due to thick mucoid effusions. The muco-ciliary clearance was normal so excluding primary ciliary diskinesia. The ear and sinus CT scan shows features of chronic otitis media, mastoiditis with left erosion of ossicular bones (see Fig. 1). CT

Fig. 1. The floor of the maxillary sinus is not level with the nasal floor, CT also shows uncinate process with the infundibulum and the middle meatus containing pathological secretions, ethmoiditis, maxillary sinusitis, bilateral, irregular aeration of sinuses.
shows also uncinate process expansion and maxillary and anterior ethmoid sinusitis (see Fig. 1). For the clinical features of sinusitis and respiratory symptoms, an evaluation to exclude cystic fibrosis was requested: sweat test (Gibson–Cooke) showed borderline value (42 mmol/l chloride) and a negative result on repeated occasion (23 mmol/l chloride, normal value for our laboratory < 30 mmol/l). Genetic analysis of cystic fibrosis transmembrane regulator gene (CFTR) was performed, to exclude atypical CF with borderline sweat test. Molecular study was performed by means of OLA assay [1] and DGGE analysis [2] of exons 3, 4, 5, 7, 11, 12, 13-1, 17b, 19, 20 of CFTR gene. No mutation was found, and the diagnosis of cystic fibrosis was excluded.

Patients behaviour during paediatric and ENT clinical visits, with hyperkinesia and tantrums, together with the mental retardation, small hands and short fingers, arose the needing for a syndromologic evaluation.

1.3. Syndromologic evaluation:

Weight 27 kg (25%), height 128 cm (10%), head circumference 51 cm (25%). Flat face with deep set eyes, bulbous nasal tip, short and featureless philtrum, mild prognatism. Brachidactyly of fingers and toes. Near complete skin syndactyly between 2 and 3rd toes. Hoarse, low tone voice. Opposite behaviour. Standard karyotype and FISH analysis with D1 7S258 probe specific for Smith–Magenis syndrome was than confirmed. FISH analysis for 1 7p 11.2 microdeletion or cryptic chromosomal rearrangements predisposing to this anomaly was performed on both parents and gave normal results.

2. Discussion

Smith–Magenis syndrome (SMS) is a contiguous-gene deletion syndrome, involving chromosome 17p1 2.1, whose incidence is estimated to be 1:25 000 livebirth.

The interstitial deletion of the short arm of chromosome 17 was first reported in 1982 by Ann Smith and Ellen Magenis in two unrelated patients presenting with congenital heart defects and facial clefts.

The typical facial dysmorphisms, that become more evident with age, include; brachycephaly, prominent forehead, synophrys, epicanthal folds, up-sianting of the palpebral fissures, close set and deep set eyes, ear anomalies, depressed and wide nasal bridge, midface hypoplasia, prognathism, broad and square face.

Significant findings are otolaryngologic abnormalities like hoarse voice, eye defects, scoliosis, brain abnormalities (ventriculomegaly in particular), peripheral neuropathy, low thyroxine levels, low Ig levels, forearm abnormalities and brachydactyly.

Less commonly reported are cleft lip and palate, cardiac abnormalities, seizures, renal anomalies, hearing impairment. The final height is usually below normal.

The behavioural pattern of the affected patients might suggest the diagnosis; self-destructive behaviour such as head banging, wrist biting, onychotillomania (pulling out finger and toenail) and polyembolochoilomania (the insertion of foreign bodies into body orifices) characterises the syndrome. Self hugging behaviour, sleep disturbances, stereotypies, are also referred. Mental retardation of various degrees is typical too.

This report refers to a new case of Smith–Magenis syndrome in a 9 year girl presenting with ENT manifestations. By reviewing the literature no description of patients affected by chronic purulent otitis, sinusitis and mixed hearing-loss was reported.

Chronic inflammation of the ear in Smith–Magenis even though non specific could be related to middle ear effusions, probably due to Eustachian tube malfunction, which might be related to shallowness of the nasopharynx, base of skull anomalies, or perhaps even to tubal anomalies. About sinusitis no anatomical alterations of paranasal sinuses are known in Smith–Magenis.

The behavioural features of paediatric patient with hearing-loss may be similar to those of patients with genetic syndromes, then the overlapping of symptoms must be taken into consideration when evaluating the paediatric patient and genetic diseases must be excluded.
The otolaryngologist’s role in the ongoing care of this kind of young mixed hearing-impaired patient does not end with diagnosis and referral to genetics and birth defect specialist. The otolaryngologist should see the patient at 3–6 month intervals to rule out and treat minor but significant problems such as wax impactions, middle ear effusion, or external otitis, perhaps caused by irritation/allergy to the hearing aid mold. Later visits may be at more extended intervals, but will permit the otolaryngologist to be alert for symptoms of progression or fluctuation of hearing-loss, vertigo or the earliest signs of others ENT disease.

In our case, the correct genetic diagnosis permitted an adequate psychological support to the family and patient together with the complication of the hearing aid. The frequency of many different anomalies in SMS suggests that these patients should be evaluated thoroughly for associated complications both at the time of diagnosis and at least every two years thereafter. A multidisciplinary approach is then needed in the management of such difficult patients.

References


Further Reading