

ASSOCIATION OF SENSORY IMPAIRMENT WITH AUTISM

Dear Editor,

We read with interest A. G. Gordon's response (Gordon, 2007, is every cause of autism a definite cause of deafness?) to our case report about the association of Waardenburg syndrome with intellectual disability, autistic spectrum disorder and unprovoked aggressive outburst (Kiani *et al.*, 2007). His letter highlights an interesting link between autism and hearing impairment and offers a different perspective on the aetiology of autism.

Hearing impairment and autism are both disorders of communication and can therefore be mistaken for each other during early childhood. Children eventually diagnosed with autism are often initially thought to be deaf by the parents (Grewe *et al.*, 1994). However, both conditions may be present in a child simultaneously. Rosenhall *et al.*, (1999) studied the presence of hearing impairment in those with a diagnosis of autism and found that 9.5% had a hearing impairment (sensorineural and/or conductive hearing loss). The prevalence of profound hearing impairment in their study was about 3.5%.

Jure *et al.*, (1991) reported a 4% prevalence of autism in 1150 children with hearing impairment. They did not find any association between the severity of hearing impairment and autistic traits, but there was a relationship between the degree of intellectual disability and the autism (i.e. the higher the degree of intellectual disability, the more severe the autism). This observation is consistent with the large

body of evidence showing an increased prevalence of autism and autistic traits in people with more severe intellectual disability (Deb and Prasad, 1994).

The complex relationship between intellectual disability and autism is well-known in the literature (Berney, 2000). This means that attribution of a new behavioural phenotype (including autistic traits) to a genetic syndrome (and/or a sensory impairment) alone should be made cautiously, as such an association is more probably mediated through intellectual disability (O' Brian, 2006).

The association between autism and sensory impairment is not just limited to hearing impairment. Clinicians in their day to day practice are aware of association of autism with hypo/hypersensitivity to certain sensory stimuli. A recent study (Kern *et al.*, 2007) on sensory processing in autism shows that there are abnormalities in main sensory modalities (touch, oral, visual and auditory) and these seem to be interrelated. This supports the hypothesis that sensory dysfunction in autism is global in nature.

Results of the various studies on sensory impairment and autism also show a clear association between visual impairment and increased autistic-like symptoms. However, it seems that this association has been mediated through brain damage (readers are advised to refer to Pring, 2005 for an excellent review of the subject). A well known example of this association can be seen in children with congenital rubella syndrome where

there is a complex comorbidity of brain damage, intellectual disability and hearing and visual impairments (Chess, 1971). Of particular interest is the term "blindism" which may be easily mistaken for autism. Symptoms include light gazing, stereotypical behaviours (e.g. rocking, twirling and spinning) and eye pressing in congenitally blind children (Warren, 1986, quoted in Carvill and Marston, 2002).

In autism there is qualitative impairment in the triad of socialisation, reciprocal communication and imaginative play along with the presence of narrowed interests and activities and stereotypical behaviours. Deaf and/or blind children may have repetitive, stereotypical behaviours and impairment in bilateral communication, but these are secondary to sensory deprivation and not to autism. They may also impose a predictable routine and clear structure to their daily activities to be able to feel in control and make sense of their environment (Edwards, 2004). These should not be mistaken with autism.

Currently, autism is considered to be a neuro-developmental disorder and the main theories on its aetiology (e.g. genetic) adopt a top-down approach. However, it is both thought provoking and exciting to hear about a bottom up theory (e.g. otogenic theory) discussed in A. G. Gordon's letter. It not only keeps the debate open and raises deaf awareness in people with autism but also provides different options for therapy and maybe even an explanation for why certain therapeutic approaches (e.g. sensory integration) in autism are more effective than the others.

In conclusion, it should be remembered that not all cases of autism can be explained by the presence of visual or hearing impairment and similarly most people with sensory impairment do not have autism. It is well known that a diagnosis of a sensory impairment can be overshadowed

by intellectual disability and vice versa (double jeopardy) (Timehin and Timehin, 2004). The presence of an autistic spectrum disorder can further complicate assessment and lead to a delayed diagnosis with disastrous developmental consequences. Let us hope further research projects in this area pave the way for a better recognition and management of both conditions early in life.

***R Kiani**

Specialist registrar in learning disability,
Leicester Frith Hospital, LE3 9QF, UK
Tel: 0116 225 5273
Fax: 0116 225 5272
Email: reza.kiani@leicspart.nhs.uk

H Miller

Consultant psychiatrist
National Deaf Services
South West London and St George's
Mental Health Trust, SW12 9HW, UK
Tel: 020 8675 2100
Fax: 020 8675 2266
Email: Helen.miller@swlstq-tr.nhs.uk

S K Gangadharan

Consultant psychiatrist
Leicester Frith Hospital, LE3 9QF, UK
Tel: 0116 225 5273
Fax: 0116 225 5272
Email: Satheesh.kumar@leicspart.nhs.uk

**For correspondence*

References

- Berney, T.P. (2000).** Autism-an evolving concept. *British Journal of Psychiatry*, 176, 20-25.
- Carvill, S. and Marston, G. (2002).** People with intellectual disability, sensory impairments and behaviour disorder: a case series. *Journal of Intellectual Disability Research*, 46, 264-272.

- Chess, S. (1971).** Autism in children with congenital rubella. *Journal of autism and childhood schizophrenia*, 1, 33-47.
- Deb, S. and Prasad, K.B. (1994).** The prevalence of autistic disorder among children with a learning disability. *British Journal of Psychiatry*, 165, 395-399.
- Edwards, L. (2004).** Neuropsychological development of hearing impaired children. In: Austen, S. and Crocker, S. (Eds.). *Deafness in mind, working psychologically with deaf people across the life span*. pp. 127-143. London, Whurr Publishers.
- Gordon, A.G. (2007).** Is every cause of autism a definite cause of deafness? *British Journal of Developmental Disability*, 54, 55-57
- Grewe, T.S., Danhauer, J.L., Danhauer, K.J., Thornton, A.R. (1994).** Clinical use of otoacoustic emissions in children with autism. *International Journal of Pediatric Otorhinolaryngology*, 30, 123-132.
- Jure, R., Rapin, I. and Tuchman, R.F. (1991).** Hearing-impaired autistic children. *Developmental Medicine and Child Neurology*, 33, 1062-1072.
- Kern, J. K., Trivedi, M. H., Grannemann, B.D., Garver, C.R., Johnson, D.G., Andrews, A.A., Savla, J.S., Mehta, J.A., Schroeder, J. L. (2007).** Sensory correlations in autism. *Autism*, 11, 123-134.
- Kiani, R., Gangadharan, S. K. and Miller, H. (2007).** Case report: Association of Waardenburg syndrome with intellectual disability, autistic spectrum disorder and unprovoked aggressive outbursts: A new behavioural phenotype? *British Journal of Developmental Disability*, 53, 53-62.
- O'Brian, G. (2006).** Behavioural phenotypes: causes and clinical implications. *Advances in Psychiatric Treatment*, 12, 338-348.
- Pring, L. (Ed.) (2005)** *Autism and Blindness, research and reflections*. London, Whurr Publishers.
- Rosenhall, U., Nordin, V., Sandstrom, M., Ahlsen, G. and Gillberg, C. (1999).** Autism and hearing loss. *Journal of Autism and Developmental disorder*, 29, 349-357.
- Timehin, C. and Timehin, E. (2004).** Prevalence of hearing impairment in a community population of adults with learning disability. *British Journal of Learning Disability*, 32, 128-32.
- Warren, D.H. (1986).** Blindness and early childhood development. *American Foundation for the Blind*, University of California at Riverside.