Title | Screening for autistic spectrum disorder at the 18-month developmental assessment: a population-based study
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In summary, we have shown that the CHAT instrument, administered by public health nurses at the 18−month developmental assessment, was likely to have developmental problems not specific to autism. Children testing positive were consequently referred for routine developmental assessment. The use of the CHAT within the broader context of developmental infant screening deserves further consideration. For example, further screening of infants testing positive on the CHAT at the 18−month developmental assessment in the UK 11 has been shown to identify potential cases of autistic spectrum disorder for full diagnostic assessment. The CHAT instrument has not been widely used in this age group in Ireland to date. We report findings from a population based screening study using the CHAT instrument in a sample of 2117 infants presenting to public health nurses for 18−month developmental assessment.

Methods

Sample Group

We used a cross-sectional study design. All Public Health Nurses (PHNs) who worked in counties Cork and Kerry during the target period 2002−2004 were approached to participate in the study. A letter was sent to all 28 PHNs inviting them to attend one of seven half−day training sessions offered at various locations in counties Cork and Kerry by members of the research team. Data were collected in two phases: (i) a screening exercise and scoring of the CHAT instrument, given a presentation on childhood autism, and the study protocol was thoroughly discussed. A total of 164 PHNs attended a training session and 95% agreed to data collection (n=156).

Figure 1: social distribution of the study sample relative to the Southern Health Board catchment area

The participating PHNs invited 2,864 parents and their infants to participate in the study. A total of 76% of those approached agreed to participate (n=2117). 51% of infants administered the CHAT were male (n=1088) and 49% were female (n=1029). The socio−demographic distribution of the sample group (n=1781 with available data) was broadly representative of the socio−demographic composition of the catchment area of the former Southern Health Board area (Cork & Kerry) based on 2002 Census data, allowing for sampling variation (Figure 1).

Participants administered the CHAT at the 18−month developmental check. The socio−demographic questionnaire was self−completed by the parent. Socio−demographic data was coded into social class categories using the methodology employed in the 2002 Irish Central Statistics Office social class categorisation. The infants' social class category was coded on the basis of the higher of the parents' social class categories.

Each completed CHAT was scored by the PHN into one of three categories: high, medium or low risk for autism, based on a scoring system. If an infant scored medium or high risk for autism at the first administration, a second screening was administered approximately one month later. All second screenings were administered by the same PHN that conducted the first screening. If an infant scored medium or high risk for autism at the first administration, a second screening was administered approximately one month later. All second screenings were administered by the same PHN that conducted the first screening. If an infant scored low risk for autism at the first administration, they were categorised as having screened positive for autism and were offered full diagnostic assessments by an experienced clinical psychologist (HP), approximately six months after the second screening.

Data were analysed using SPSS version 9.0. The main outcome measures were a medium or high−risk score following two administrations of the CHAT screening instrument and a positive diagnosis of autism after clinical assessment.

Results

A summary of screening outcomes at the first screening, second screening and the outcome of clinical assessment is provided in Figure 2. A total of 29 infants from the study sample of 2117 were characterised as medium or high risk at first screening: 13.3 per 10,000 (95% CI: 13.3 to 19.6). A total of 7 of the 29 first screen positive infants were positive (medium or high risk) at second screening, 12 were low risk and 10 parents refused to participate. On subsequent clinical assessment of the 7 infants screening positive on first and second assessment, three were diagnosed with autism, one with learning disability and the remaining three were found to be at low risk for autism. On clinical assessment of five of the ten infants whose parents declined second screening, four were found to be at medium or high risk for autism: three with autism and one with attention−deficit hyperactivity disorder. Thus, a total of 7 children received a diagnosis of autism: an overall prevalence of clinically diagnosed autism of 33.1 per 10,000 (95% CI: 23.3 to 68.0). No information was obtained on five of the 10 infants who were eligible, but did not participate in a second screening.

Discussion

This study represents the first assessment of the feasibility of routine administration of the CHAT instrument as a screening tool for autism in a routine clinical setting between 18 and 20 months of age. The findings suggest that use of the CHAT questionnaire is feasible in this setting and that a significant number of autism cases can be detected.

In the UK, Baron−Cohen et al.14 screened 16,235 infants at 18 months using the CHAT instrument. They reported a screening rate for autism (medium or high risk CHAT score) of 251 per 10,000 (95% CI: 226−274) following the first administration of the instrument, a somewhat higher rate than that observed in this sample: 137.0 per 10,000 (95% CI: 91.9 to 196.1). As in the current study, a significant proportion of children who screened positive on first assessment did not return for a further assessment. In the UK study, children who scored medium or high risk after two administrations of the CHAT were offered a second screening at 2−3 years of age. In the Irish study, all screened positive infants based on the CHAT instrument were invited to attend a second screening. The screening exercise yielded 12 cases of autism per 10,000 children screened on at least one occasion (95% CI: 2.9 to 11.3) as compared with 33.1 per 10,000 (95% CI: 13.3 to 68.0) in the current study. Thus the yield in terms of prevalence of autism was higher relative to the earlier UK study. However comparisons between the two studies are constrained by the differences in sampling strategies and drop out rates.

The involvement of public health nurses in routine clinical practice, but with form training in the use of the CHAT instrument, given a presentation on childhood autism, and the study protocol was thoroughly discussed. A total of 164 PHNs attended a training session and 95% agreed to data collection (n=156).

Furthermore, the diagnostic test performance of the CHAT instrument limits the accuracy of the prevalence estimate of autism. It is reported to have a sensitivity of 38% and specificity of 98% for identifying autism in this age group.15−17 The diagnostic test performance of the CHAT instrument in our sample has been underestimated. We were not able to determine the overall diagnostic performance for the CHAT because the full diagnostic assessment was not conducted for the entire sample. The CHAT instrument has been modified and initial results from the Modified Checklist for Autism in Toddlers (M−CHAT) suggest this instrument may have higher test performance but it has not been comprehensively evaluated in a general population sample.

In summary, we have shown that the CHAT instrument, administered by public health nurses at the 18−month developmental assessment, represents a potentially feasible strategy for the early diagnosis of autism. It is an inexpensive, quick
and simple instrument for PHNs to use. Given the evidence that early diagnosis improves prognosis in autism\textsuperscript{10} there is a clear need for further work addressing the use of the CHAT instrument in routine developmental assessment in Ireland.

References


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