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How useful are the Adult Asperger Assessment and AQ-10 within an adult clinical population of all intellectual abilities?

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Abstract

Purpose – The Adult Asperger Assessment (AAA) was designed to be a screening tool to identify adults with Asperger syndrome and/or high-functioning autism. The AAA includes three questionnaires; the Autism Quotient (AQ), the Empathy Quotient (EQ) and the Relatives Questionnaire (RQ). The Autism Quotient-10 (AQ-10) was designed to be a "red flag" for healthcare professionals considering referral for ASD assessment. The purpose of this paper is to determine the usefulness of the AAA and AQ-10 as part of an adult autism diagnostic pathway that includes patients of all intellectual ability.

Design/methodology/approach – Results were obtained for all patients who had received a clinical decision at Leeds Autism Diagnostic Service, which is a service that assesses patients of all intellectual ability, during 2015, n¼214. Of these 132 were included in the analysis, 77 patients were excluded for not completing the AAA and four were excluded for not receiving a clinical decision.

Findings – Results suggest that patients diagnosed with ASD without intellectual disabilities score on average 35 on the AQ, 17 on the EQ and 20 on the RQ. Those not diagnosed with ASD score on average 33 on the AQ, 22 on the EQ and 15 on the RQ. Patients with intellectual disabilities, scores are lower on the AQ, and higher on the EQ and RQ than those without intellectual disabilities. These results are the same regardless of diagnosis of ASD. The RQ is the only questionnaire to result in a significant difference between those diagnosed and not diagnosed. Results suggest that the AQ-10 is not useful in this clinical population.

Research limitations/implications – This study was undertaken as part of a service development improvement process. The specific demographics of this clinical population may have influenced the findings. The process will need to be repeated to ensure that the results are consistent across time and increased sample size. The population of patients with an intellectual disability is small, further studies into the use of the AAA or the design of other intellectual disability specific screening tools should be pursued. It is of note that the AAA was never intended for use within an intellectual disability population.

Originality/value – This is an original paper as it will be the first to consider the usefulness of each of the aspects of the AAA collectively. It will be the first to assess: the AQ-10 alongside the AAA, the usefulness of the AAA regardless of intellectual ability and the usefulness of the AAA within a clinical population by using the diagnostic outcome as the benchmark of the usefulness of the AAA scores. This paper will only be discussing the scores generated by the AAA, and the correlation of these scores with a diagnosis.

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Keywords Autism, Intellectual disability, Assessment, Diagnosis, Adults, Autism spectrum disorder

Paper type Research paper

Introduction

Currently there are many screening tools designed for autism spectrum disorder (ASD), ranging across all intellectual abilities. Sappok et al. (2015) discuss many of the screening tools and suggest that screening tools are an economic way to assess and guide the initial diagnostic steps.

Currently National Institute for Health and Care Excellence (NICE, 2014) guidelines for ASD do not recommend a specific screening tool for children and adults with moderate to severe ID, however, the Autism Quotient-10 (AQ-10) is recommended for use with patients who do not have a moderate or severe intellectual disability. As a result of the lack of current guideline recommendations, the screening tools used by different services varies nationally. The Leeds Autism Diagnostic Service (LADS) currently uses the Adult Asperger Assessment (AAA), however, some patients find the completion of the forms overwhelming. The purpose of this service development is to assess the usefulness of the scores produced by the completion of the AAA questionnaires in order to reevaluate the initial packs which are posted to patients prior to their first appointment.

The AAA was originally designed by Baron-Cohen et al. (2005) to create a new instrument relevant to the diagnosis of Asperger syndrome (AS) or high-functioning autism (HFA) in adults. It included the Autism Quotient (AQ) and Empathy Quotient (EQ), the Relatives Questionnaire (RQ) was later included when revised from the Childhood Asperger Syndrome Test (CAST) (Scott et al., 2002). Baron-Cohen et al. (2005) stated that all existing instruments were designed for children, however, Wing and Gould (2006) highlight that instruments did exist that could be used for both adults and children such as the ASDI (Gillberg et al., 2001) and the DISCO (Wing et al., 2002), which provide relevant information across the spectrum. It is recommended, by Baron-Cohen et al. (2005), that the AAA is used as a screening instrument for the diagnosis of ASD, to identify persons who would benefit from a full assessment.

The current diagnostic criteria in the Diagnostic and Statistical Manual 5th edition (DSM-V) for ASD is a dyad of impairments; social communication and interaction and restricted, repetitive patterns of behaviour, interests or activities (American Psychiatry Association, 2013). The International Classification of Diseases (ICD-10) still includes AS, atypical autism and childhood autism as separate diagnoses (World Health Organisation, 1992). Therefore due to the current disparity between the DSM-V and the ICD-10, ASD will be the term used for the purpose of this paper, ensuring inclusion of all possible diagnoses. It is understood that the AAA was designed for those diagnosed with AS or HFA (Baron-Cohen et al., 2005), however, the possible change in diagnostic criteria may mean that screening instruments previously aimed at specific areas of the autistic spectrum need to be adapted. Therefore, this paper will aim to assess the usefulness of the AAA regardless of intellectual ability, within the remit of the person completing the questionnaires having the ability to read and understand the questions.

Much of the previous literature explores the usefulness of the AAA using a control group and a group of patients previously diagnosed with AS or HFA (Baron-Cohen et al., 2001; Baron-Cohen and Wheelwright, 2004), however, this poses a limitation as a control group differs greatly from the

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presentation of a clinical population (Davidson et al., 2015). In addition, although the original study that measured the AAA (Baron-Cohen et al., 2005) did use a clinical population, the sample size was small (n¼42) and furthermore the sample size of those not diagnosed was extremely limited (n¼8). To date there is no literature on the inclusion of the RQ into the AAA, and how the three questionnaires function together.

Further research into the AQ has been completed. Woodbury-Smith et al. (2005) used a clinical population and recommended that a higher cut-off score of 32 be used, as opposed to the score of 26 resulting from an 83 per cent sensitivity, in order to minimise the amount of false positives. A further big-data population study of over 450,000 self-selecting individuals from the general population, who completed the AQ online generated a mean score of 19.83 (Ruzich et al., 2015). However, crucially, it is unknown how many participants were diagnosed with ASD or not, and there is no discussion on the intellectual ability of participants. A recent literature review found that there is a difference between the scores generated within a clinical (35.19) and non-clinical population (16.94), and also that within a clinical population there are no gender differences despite reported gender differences in a non-clinical population (Ruzich et al., 2015).

Research into the EQ suggests that females have more empathy than males (Baron-Cohen and Wheelwright, 2004), one theory from Baron-Cohen (2002) suggests that ASD is an "extreme of the normal male profile". Voracek and Dressler (2006) also found females to be superior on the EQ.

As previously stated the RQ was developed from the CAST, and it is included in the AAA training provided by clinicians who were involved in the Cambridge Lifespan Asperger Syndrome Service (CLASS). However, no further literature can be found on the RQ. The original authors of the CAST suggest that it is a useful screening tool for primary-school aged children (Scott et al., 2002). The study excluded participants diagnosed with ASD. Williams et al. (2008) reported gender differences, in that males (median¼5) score higher than females (median¼4). The sample used was large and included children between the ages of four and nine who were not diagnosed with ASD, interestingly the mean scores are not reported.

The AQ-10 was designed to be a short questionnaire appropriate to all ages to assist healthcare professionals considering referring patients for further ASD assessment (Allison et al., 2012). The AQ-10 is derived from the AQ-50. It is suggested by the original authors that a score of 6 or more is supportive of referring patients for further assessment; this score was generated from a sample of patients previously diagnosed with ASD and a control group. A further study found sensitivity to be 79.87 per cent and specificity to be 87.31 per cent using a sample of previously diagnosed participants and a sample of controls without an ASD diagnosis (Booth et al., 2013). The AQ-10 is recommended for screening of ASD among adults who do not have a severe or moderate intellectual disability by the NICE (2014).

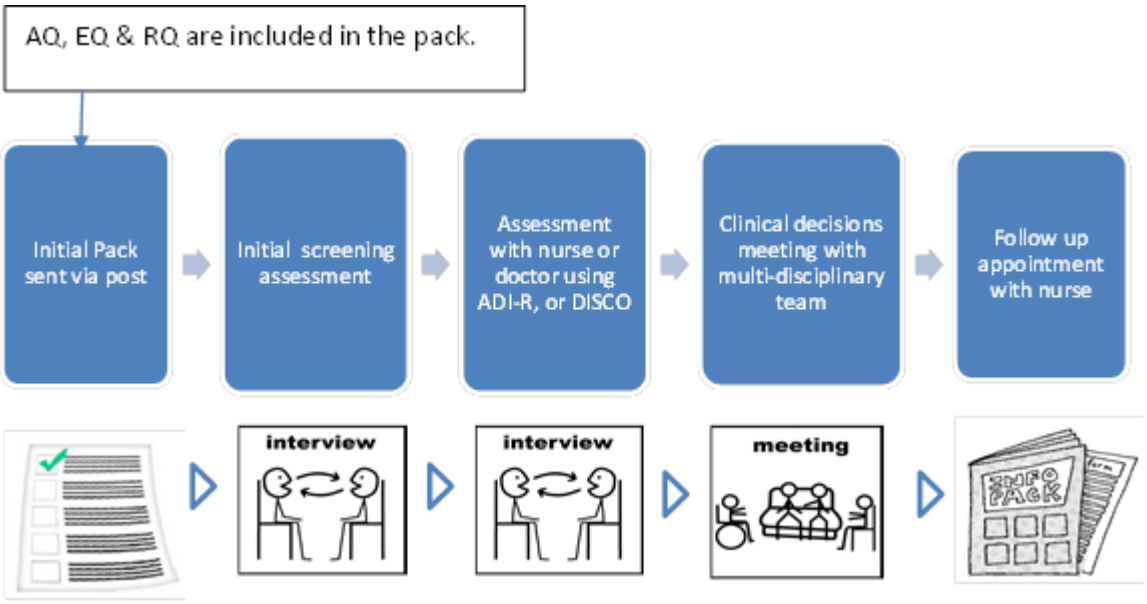
Method

Setting

The clinical pathway used by the LADS (Davidson et al., 2015) includes five stages (Figure 1). The initial stage is where an initial pack is sent in the post which includes the AQ, EQ and RQ alongside other information. On receipt of this information, a further initial screening assessment is undertaken

by a clinician from the team to exclude significant physical or mental health issues and to prepare each patient for the pathway process and expectations about diagnosis, etc. Crucially this service is for adults with no upper age limit or minimum intellectual ability requirements, and therefore the results will be representative of an all-inclusive population of adults using the AAA as a screening instrument for the purpose of diagnosing ASD. The LADS team accept referrals from a variety of areas such as; primary care, self-referral and Adult Mental Health Services (Davidson et al., 2015).

Figure 1 Leeds Autism Diagnostic Service Care Pathway



Participants

The sample was obtained from all patients who had received a clinical decision during 2015 at LADS, n=214. All participants had to meet the inclusion criteria of completing all three questionnaires of the AAA and to have received a diagnosis of ASD or to not have received a diagnosis of ASD. Meaning that 77 patients were excluded for not completing all three questionnaires and a further five were excluded for not receiving a diagnostic outcome. For those who do not receive a diagnosis outcome no clinical decision is made, for reasons such as lack of developmental history. Resulting in a sample of n=132 to be included for analysis, of which 33 per cent (n=43) were diagnosed with ASD and 64 per cent (n=89) were not diagnosed with ASD (Figure 2). The sample has been split into two groups:

Group 1: patients who had completed all three aspects of the AAA and do not have an intellectual disability.

Group 2: patients who had completed all three aspects of the AAA and are known to have an intellectual disability.

AQ-10 data were collected for all patients who had received a clinical decision for ASD and had completed the AQ, n¼173. Again this was split into two groups:

Group 3: patients who had completed the AQ-10 and do not have an intellectual disability.

Group 4: patients who had completed the AQ-10 and are known to have an intellectual disability.

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Figure 2 Demonstrating the group formation

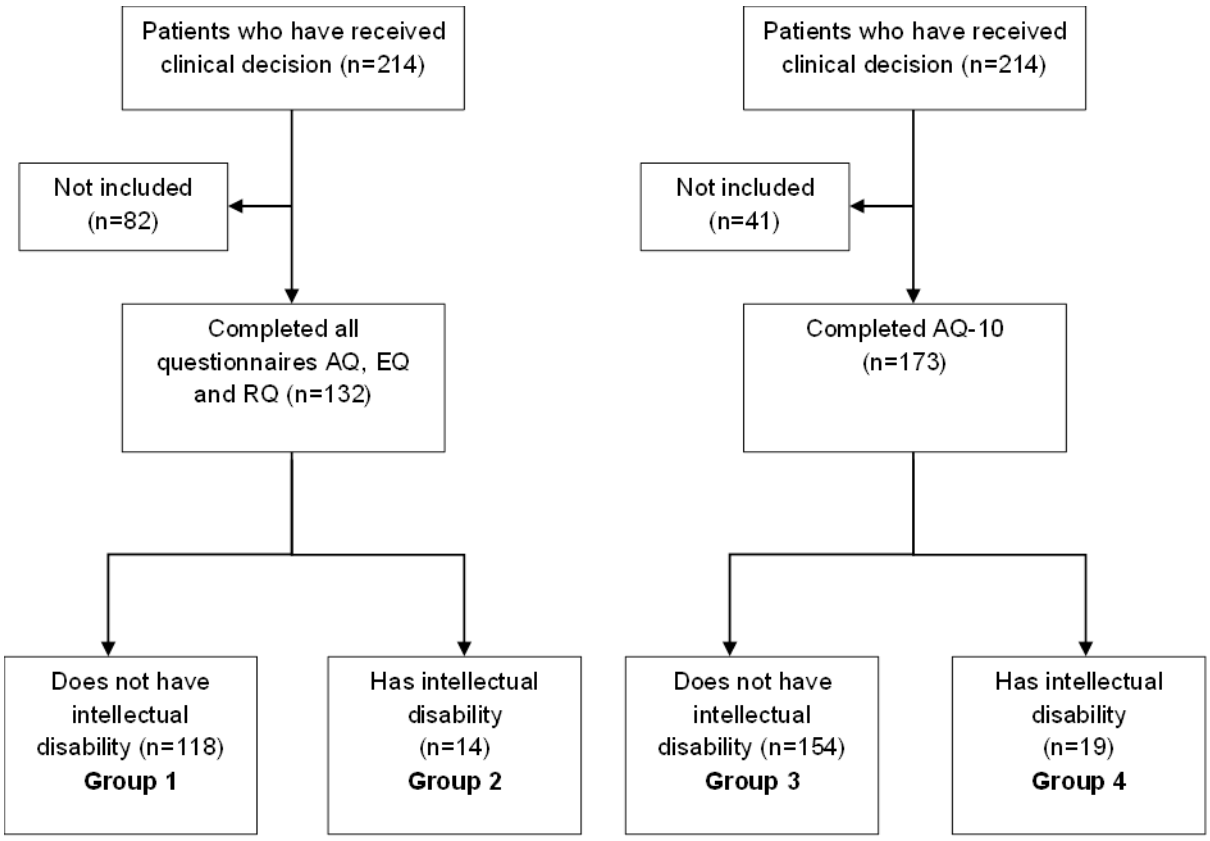

Table I demonstrates the diagnostic result by gender for each group and Figure 2 demonstrates the group formation.

Table I The sample size of each group by gender

		Group 1	Group 2	Group 3	Group 4
Diagnosed	Sample size	38	5	46	10
	Female	16 (34%)	1(33%)	19 (32%)	2 (50%)
	Male	22 (31%)	4(36%)	27 (28%)	8 (53%)
Not diagnosed	Sample size	80	9	108	9
	Female	31 (66%)	2(67%)	40 (68%)	2 (50%)
	Male	49 (69%)	7(64%)	68 (72%)	7 (47%)

Procedure

All patients accessing an ASD diagnostic assessment are posted the AQ, EQ and RQ and are asked to return them prior to the initial screening assessment. Inclusion criteria was set that all patients must

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have completed the AQ, EQ and RQ and that the patient must have either been diagnosed or not diagnosed (n=132). Data were collected for these patients and analysed. The small sample size of patients with a known intellectual disability was deemed insufficient to assess for gender differences.

Following presentation of the findings to a national group of experts working in the field of ASD, it was suggested that it would be extremely useful for clinicians to understand the usefulness of the AQ-10 when compared to the clinical diagnoses. Given that the AQ-10 is currently recommended for the screening of adults without a moderate or severe intellectual disability for ASD within NICE (2014) guidelines. As LADS do not routinely use this abbreviated version of the AQ, patients themselves did not complete the AQ-10. Instead AQ-10 scores were generated for each patient that had completed the AQ by using the answers the patient had selected during their completion of the AQ.

Approval has been granted by the Leeds and York Partnership NHS Foundation Trust to publish the results of this service development.

Measures

The AQ, AQ-10 and EQ are completed by the patient being assessed for ASD and the RQ is completed, where possible, by someone who knew the patient between the ages of four and ten. Each questionnaire generates a score, and each has a suggestive cut-off point at which ASD is highly likely. Each of the questionnaires, except the RQ, include a set of statements with the following scale of answers of which the respondent must select one: definitely agree, slightly agree, slightly disagree and definitely disagree. The responses were converted into a corresponding numerical value which was input into a spreadsheet which calculated a final score based on the algorithm as described in Baron-Cohen et al. (2005) and Scott et al. (2002). For the RQ the only possible answers are “yes” or “no” and again only one answer must be selected. The AQ is includes 50 questions with a score 32 or above being suggestive of ASD, the maximum score being 50. The EQ includes 60 questions, with a score of 30 or below being suggestive of ASD, the maximum score being 80. The higher the score on the EQ, the less likelihood there is of ASD. The RQ includes 39 questions, with a score of 15 or above being suggestive of ASD, the maximum score being 31. The AQ-10 includes 10 questions, with a score of 6 or above then referral to a specialist should be considered, the maximum score being 10. The minimum score for all the questionnaires is 0.

Results

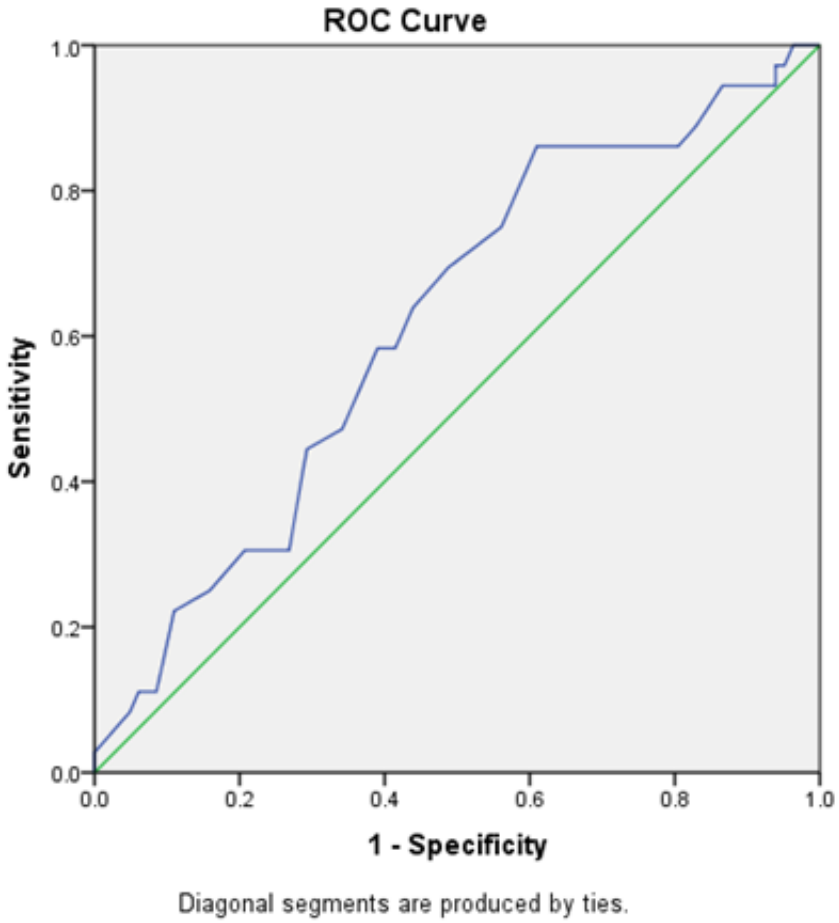
Only 58 per cent of people were diagnosed on the AQ, EQ and RQ at the current cut-off points, whereas 24 per cent of people were not diagnosed on the AQ, EQ and RQ.

AQ

Group 1. For the AQ, the mean score for those diagnosed was 35 (SD=7.8, range 18-48), and for those not diagnosed the mean score was 33 (SD=8.4, range 15-47). There is no statistical significance between these two groups ($p>0.05$). If the current cut-off point of 32 or above is taken as being suggestive of ASD, of the people diagnosed 68 per cent scored positively, and of the people not diagnosed 49 per cent scored positively. Sensitivity and specificity results were also tested. For the AQ sensitivity (true positive rate) was 68 per cent and specificity (true negative rate) was 51 per cent, positive predictive value (PPV) was 40 per cent and negative predictive value (NPV) was 77 per cent. Area under the receiver operator characteristic curve (ROC) are a plot of false positives against true

positives for all cut-off values. The area under the curve of a perfect test is 1.0 and for a test which is not useful is 0.5. For the AQ the ROC curve was 0.618 (Figure 3). Using a 75 per cent sensitivity cut-off point would suggest a cut-off score of 31 or above.

Figure 3 ROC curve for AQ results.



Gender differences were notable, diagnosed females scored higher than diagnosed males; however, the gender difference were reversed for those not diagnosed. The mean score of females diagnosed 38 (SD=5.7, range 30-48) and the mean score of males diagnosed was 34 (SD=8.8, range 23-47). The mean score of females not diagnosed was 32 (SD=7.7, range 17-47) and the mean score of males not diagnosed was 33 (SD=8.8, range 18-47). There was no significant difference between males and females for either those diagnosed or not diagnosed ($p>0.05$).

Group 2. The mean score for people with an intellectual disability and diagnosed was 34 (SD=3.36, range 30-38) and the mean score for people with an intellectual disability and not diagnosed was 27 (SD=6.09, range 16-35). The sample size of group 2 was deemed too small to test for significance.

EQ

Group 1. When considering the EQ the mean score for those diagnosed was 17 (SD=10.1, range 3-47), and for those not diagnosed the mean score was 22 (SD=10.4, range 4-49). The two groups were

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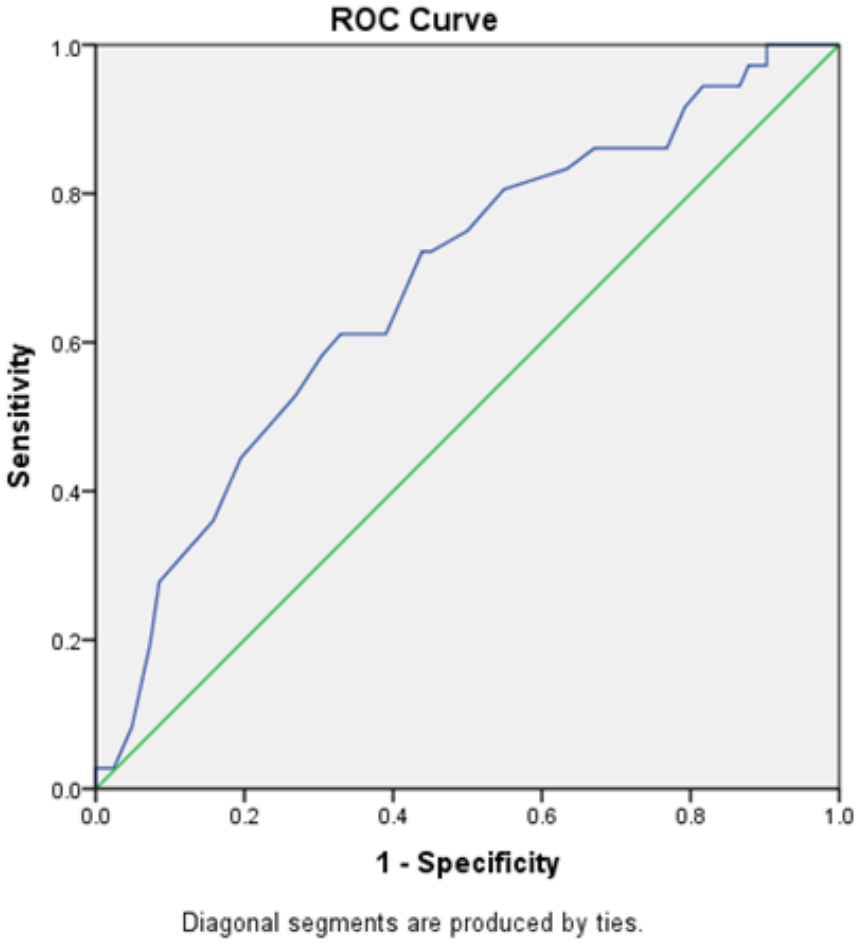
not significantly different (p>0.05). If the current cut-off point of 30 or below is taken as being suggestive of ASD, of the people diagnosed 89 per cent scored positively, of the people not diagnosed 44 per cent scored positively. Sensitivity and specificity results were also tested. For the EQ sensitivity was 89 per cent and specificity was 56 per cent, PPV is 39 per cent and NPV is 92 per cent. Area under the ROC was 0.678 (Figure 4). Using an 81 per cent sensitivity cut-off point would suggest a cut-off score of 24 or below.

Figure 4 ROC curve for EQ results



Gender differences were notable, diagnosed males scored higher than diagnosed females. There are no gender difference for those not diagnosed. The mean score of females diagnosed was 15 (SD=7, range 3-30) and the mean score of males diagnosed was 19 (SD=11.7, range 6-47). The mean score of females not diagnosed was 22 (SD=11.9, range 6-49) and the mean score of males not diagnosed was 22 (SD=9.4, range 4-46). There was no significant difference between males and females for either those diagnosed or not diagnosed (p>0.05).

Group 2. The mean score for people with an intellectual disability who were diagnosed as meeting the criteria for ASD was 21 (SD¼9.63, range 13-37) and the mean score for people with an intellectual disability who were not diagnosed was 32 (SD¼11.67, range 17-49).

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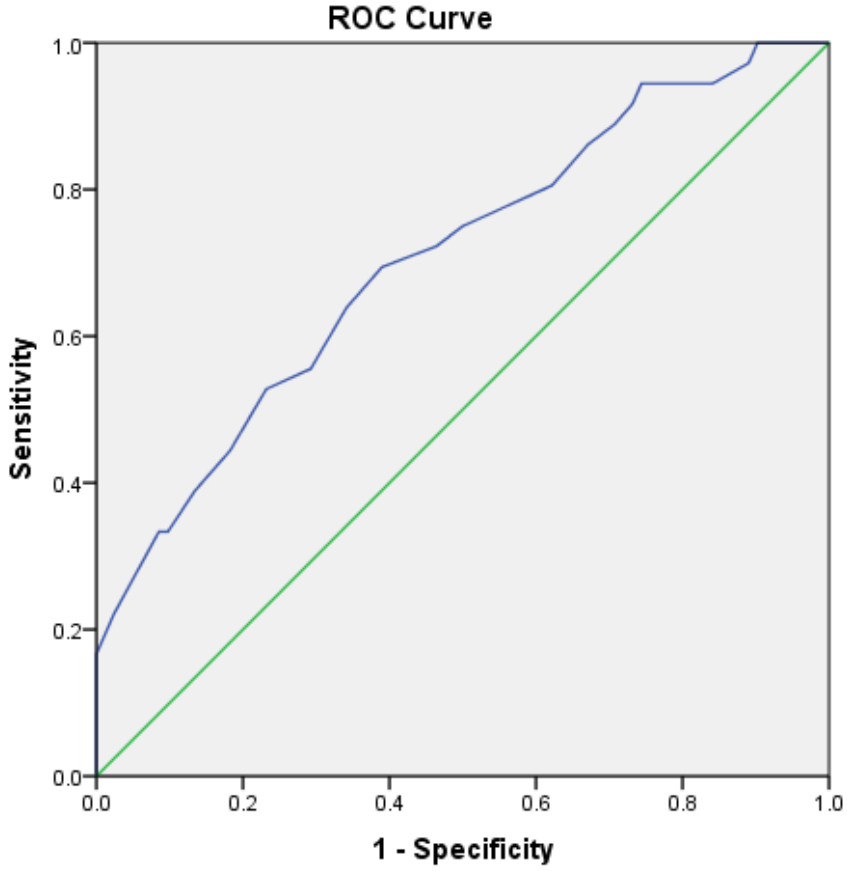
RQ (CAST)

Group 1. When considering the RQ the mean score for those diagnosed was 20 (SD=6.6, range 4-30), and for those not diagnosed the mean score was 15 (SD=7.1, range 0-26). There was a significant difference between people diagnosed and people not diagnosed ($p<0.05$). If the current cut-off point of 15 or above is taken as being suggestive of ASD, of the people diagnosed 79 per cent scored positively and, of the people not diagnosed 55 per cent scored positively. Sensitivity and specificity results were also tested. For the RQ sensitivity was 79 per cent and specificity was 45 per cent, PPV was 41 per cent and NPV was 82 per cent. Area under the ROC curve was 0.706 (Figure 5). Using a 81 per cent sensitivity cut-off point would suggest a cut-off score of 14 or above.

Figure 5 ROC curve for RQ results



Gender differences are notable; females score higher than males regardless of diagnosis. The mean score of females diagnosed was 21 (SD=5, range 10-30) and the mean score of males diagnosed was 20 (SD=7.6, range 4-29). The mean score of females not diagnosed was 14 (SD=7.3, range 0-26) and the mean score of males not diagnosed was 15 (SD=6.9, range 0-26). There was no significant difference between males and females for either those diagnosed or not diagnosed ($p>0.05$).

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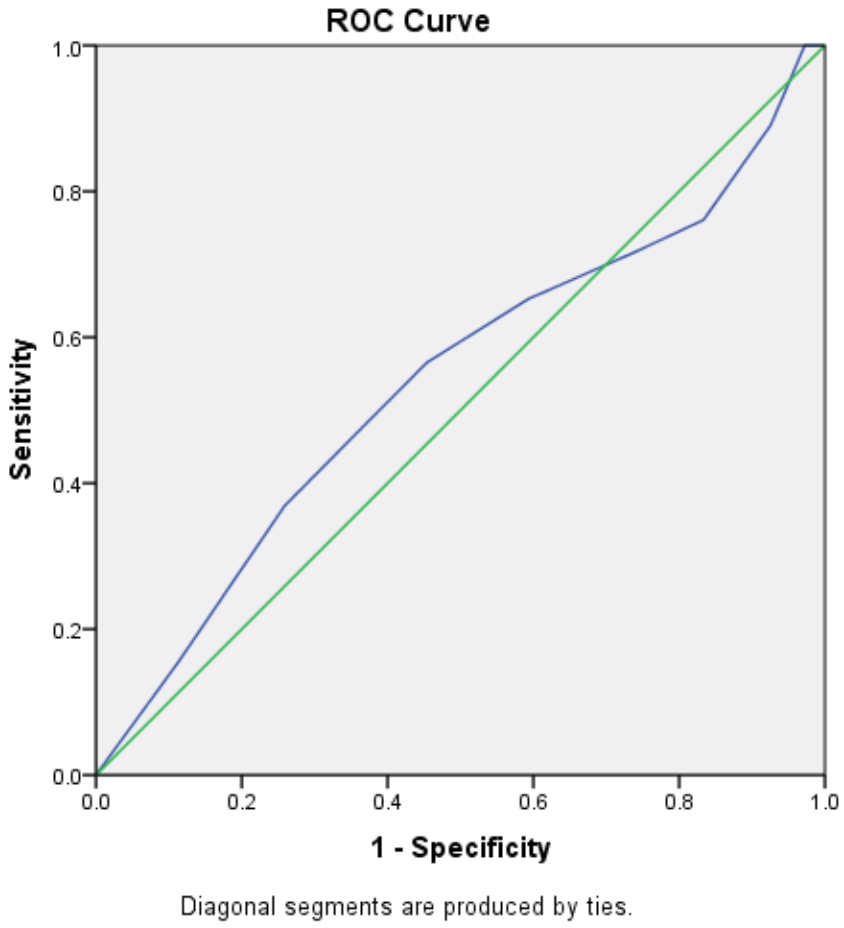
Group 2. The mean score for people with an intellectual disability who were diagnosed was 22 (SD=4.39, range 17-28) and the mean score for people with an intellectual disability who were not diagnosed was 18 (SD=4.24, range 13-26).

AQ-10

Group 3. When considering the AQ-10 the mean score for those diagnosed was 7 (SD=2.32, 2-10), and for those not diagnosed the mean score was 7 (SD=2.32, 0-10). There was not a significant difference between those diagnosed and not diagnosed ($p>0.05$). If the current cut-off point of 6 or above is taken as being suggestive of ASD, of the people diagnosed 72 per cent scored positively, of the people not diagnosed 74 per cent scored positively. This means that for those patients who did not receive a diagnosis of autism more score positively on the AQ-10 than those patients who were diagnosed. Sensitivity and specificity results were also tested, for the AQ-10 sensitivity was 72 per cent and specificity was 35 per cent, PPV was 29 per cent and NPV was 75 per cent. Area under the ROC curve was 0.540 (Figure 6). Using a 76 per cent sensitivity cut-off point would suggest a score of 5 or above.

Figure 6 ROC curve for AQ-10 results.



The mean score of females diagnosed was 8 (SD=1.83, range 4-10) and the mean score of males diagnosed was 6 (SD=2.65, range 2-10). There was a significant difference between males and

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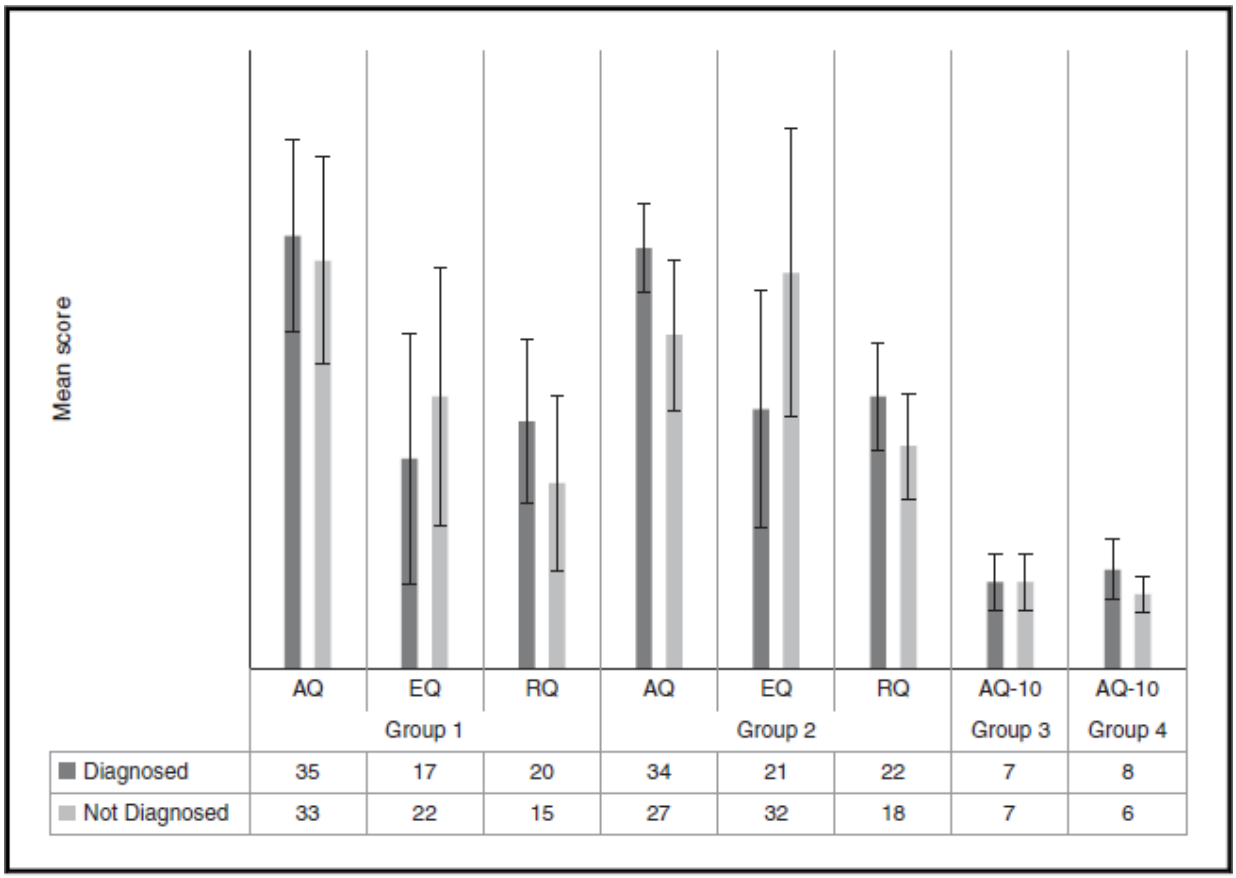
females diagnosed ($p<0.05$). The mean score of females not diagnosed was 7 (SD=2.44, range 1-10) and the mean score of males not diagnosed was 7 (SD=2.25, range 0-10). There was a significant difference between males and females not diagnosed ($p<0.05$).

Group 4. The mean score for people with an intellectual disability who were diagnosed was 8 (SD=2.46, range 3-10) and the mean score for people with an intellectual disability who were not diagnosed was 6 (SD=1.39, range 3-8). The sample size was deemed too small to test for significance (Figure 7).

Figure 7 Representing the mean score and standard deviation for each of the questionnaire results



Discussion

Limitations

As the AQ-10 scores were generated from the patients first hand completion, it is unknown whether if it had being administered as a defined tool if this would have influenced the results. Also the specific demographics of this clinical population may have influenced the findings, and it would therefore be beneficial to repeat the process including other services and also a larger sample size. Additionally the population of patients with an intellectual disability is small, and therefore were not tested for significance and therefore these results can only be used a preliminary findings. It would be beneficial if further studies into the use of the AAA or the design of other intellectual disability specific

screening tools were pursued and explored further. As it is of note that the AAA was never intended for use within an intellectual disability population.

The purpose of this study was as a service development project to assess the initial part of the LADS pathway which included the AAA. Feedback from service user questionnaires has suggested that the initial pack sent to patients (which includes the AAA) can be overwhelming particularly those with intellectual disabilities. In order to consider whether it was beneficial to amend the content of the initial pack, we first needed to determine the usefulness of the AAA within our clinical population.

We considered the usefulness in four specific areas:

1. the current AAA cut-off points within a clinical population of patients being assessed for ASD without an intellectual disability;
2. the current AAA cut-off points within a clinical population of patients being assessed for ASD with an intellectual disability;
3. the previously reported gender differences in the scores of the AAA; and
4. the AQ-10.

The first aim was to assess the usefulness of the current AAA cut-off points within a clinical population of patients being assessed for ASD. The results suggest that statistically the RQ is the most useful measure, as it was the only questionnaire where a significant difference was found between those diagnosed and not diagnosed. This could be because the AQ and EQ are self-report measures and Jackson et al. (2011) found that individuals with AS have impairment in self-understanding. However, the RQ is still by no means a truly reliable measure, the PPV is only 41 per cent. Furthermore the findings of this study replicate the findings of Ruzich et al. (2015), who found the mean AQ score of patients diagnosed to be 35 and that there is an "apparent gap between clinical and non-clinical scores". Overall it could be said that the scores generated from AAA are not useful within our specific clinical population, but instead greater importance should be placed on the AAA questionnaire to gather information. If further evaluation by the LADS team suggests that even when using a larger sample over a greater time period that the AAA scores are still not found to be useful then a question to consider is if the clinical diagnostic benchmarks at LADS are representative nationally. If so it would be useful for further studies to include other diagnostic services.

It is important to note, that the screening questionnaires are not used by LADS to determine whether further assessment is completed but merely as a method of acquiring useful information prior to the initial assessment which may help to influence the types of questions that need to be asked. For those services that use the AAA as a way of determining whether people should be assessed, our results may have a significant impact.

As LADS assesses patients of all intellectual ability, it is important to assess the usefulness of the AAA for those with an intellectual disability. In an attempt to simplify the care pathway, the same pathway is used whether or not an intellectual disability is present. Obviously where specific adaptations to gold standard tools exist, then the appropriate version is used, e.g. ADOS version is dependent on level of intellectual disability. In the absence of an intellectual disability specific screening tool (Sappok et al., 2015) the AAA forms are included in the initial packs. Although it is acknowledged that it is difficult for some people with intellectual disability to complete the forms the production of a standardised format looking at the various features of autism is useful to the clinician

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completing the initial screen even if the questions have not been accurately completed as this can be reviewed with the patient and their carer. The results for the intellectual disability population highlight the low completion rates which might lead to a conclusion that the AAA as a whole is not appropriate for patients with an intellectual disability. However, the structure of the automatically produced interview questions may well be. The team have discussed at length whether or not to send different packs depending on the presence/absence of intellectual disability, but this is fraught with difficulties, not least sending the wrong pack to the wrong patient and causing offence. On balance, the team have decided to adapt the initial pack to include an easy read sheet (developed by the easy on the i team (Leeds and York Partnership NHS Foundation Trust, 2016)) which clearly states that the receiver should not be concerned if they struggle with the forms, and that they can be completed at the first appointment with support from the clinician. Although one option is to only send out the RQ, the data produced by the AAA forms can be used to support the developmental history even if the scores are not regarded as suggestive of a diagnosis. An alternative viewpoint is that the AAA is useful for those with an intellectual disability that are able to complete it, as the results do not vary a great deal from the population of people without an intellectual disability. However, these findings are only preliminary due to the sample size, further research would be required to assess the usefulness of the AAA for patients with an intellectual disability.

As previously discussed gender differences are reported for the AAA, however, the findings of this study oppose previous findings. This study found that on average females score higher on the EQ than males. Remembering that the lower the score the lower the higher the likelihood of ASD, this finding challenges the “extreme male brain” theory (Baron-Cohen, 2002). This could be due to LADS proportionally diagnosing equally males and females. Of all the patients that LAD diagnosed within 2015, of the females assessed 33 per cent were diagnosed and of the male assessed 32 per cent were diagnosed.

Following a discussion with national experts, another aim of this study was to assess the usefulness of the AQ-10 within a clinical population. Results found that more patients that were not diagnosed with ASD score positively on the AQ-10 than patients who did receive a diagnosis of ASD. Therefore it can be concluded that the AQ-10 is not useful within a clinical population and should not be relied on as a way of screening appropriate referrals onto a diagnostic pathway. Statistical analysis also support this finding, NPV¼75 per cent and the area under the ROC curve was found to be 0.540.

Conclusions

The LADS has been undertaking diagnostic assessments for over five years. During that time we have continually scrutinised our outcomes and questioned the validity of what we do, amending the pathway when improvements are suggested or issues arise (Davidson et al., 2015).

The Clinical Lead undertook AAA training in Cambridge in 2011 to learn more about the high functioning ASD population having come from a background of intellectual disability. The training described how the AAA had been developed, but more importantly gave clear guidance about how to acquire a good developmental history within the high-functioning population. Following this initial training, Janine Robinson (Robinson Ruthenburg, 2016) agreed to provide training for the whole team in Leeds in 2012. This enabled clinicians (who have been trained across the intellectual spectrum) to discuss various aspects of the assessment process and review the different needs of those regarded as high-functioning and those within the intellectual disability range. It is the type of questioning

required dependent on the intellectual ability of the patient that has been useful. The general consensus that the actual scores of the tool were not necessarily relevant was highlighted early on in the team's development. When the entire team decided to "take" the screening tool to see how we scored. Subsequently, we have continued to include the screen as part of the LADS pathway, as it provides some useful initial information to guide the initial assessment.

The results of this review have highlighted some significant issues which the team will need to consider going forwards. The initial assessment pack causes consternation and distress for some of the patients we see, but deciding what to "take out" is a constant debate. The value of the AAA forms to LADS is in the provision of a structured history to guide the initial assessment. Having reviewed the scores it is clear that these should not be used to influence the final outcome. Although as a service we do not routinely use the AQ-10, these results clearly highlight that this would not be a useful tool to rely on in order to screen patients appropriately into an autism diagnostic service. With regard to the AQ and EQ scores, even if the people with intellectual disability are excluded it does not appear to be a useful indicator for autism for the clinical population seen in Leeds, but rather a structure for assessment.

Autism is a clinical diagnosis. However, the developmental information provided by a relative is widely recognised as crucial and this is upheld by the outcomes for the RQ. A good history from a relative is essential in reaching a clinical decision with regard to a diagnosis of autism.

Anyone involved in the clinical process of diagnosing autism in adults knows that the process is complex and diverse. Early pioneers such as the clinicians in the CLASS clinic presumably intended to provide a screening tool to guide clinicians towards an accurate diagnosis of ASD. They did this by utilising a relevant set of questions that would reveal information about features of the condition. It was never intended to replace a good clinical assessment, but as services have developed and experience has expanded, the use of scores to determine a diagnosis in a heterogeneous population where women are diagnosed as frequently as men, may no longer be realistic. Services such as LADS are reliant on the expertise of the patients they see to improve the service they provide. This service development review was prompted by patients and as always we remain grateful for their honest and informative feedback.

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