Recent Research into Therapeutic Outcome Measures

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Abstract

Accurate measurement of clinical outcomes forms an important part of evidence-based practice. When measuring treatment outcomes in ADHD, clinicians have tended to focus on symptoms. In the past these were generally assessed by using parent-rated or teacher-rated questionnaires. Recently, however, the focus has switched to clinician-rated measures, often using symptom questionnaires like the ADHD-IV RS and the SNAP-IV as the basis of a semi-structured interview. Helpful clinically-relevant cut-offs have been described but need further validation. Similar interviews can be used for gathering information from schools. There are also, however, several instruments, such as the SKAMP, that are specifically designed for use with teachers that can be integrated into clinic protocols. In addition, a range of disorder-specific and generic measures of impairment and quality of life can provide valuable information about broader outcomes. Recent research suggests that the relationships between symptoms and cognition in ADHD are complex. However, whilst this suggests that it may be useful to think about measuring neuropsychological performance alongside symptom scores, this is currently difficult to achieve as it is not clear which measures would be the most appropriate to use.

Integrating Recent Research on Therapeutic Outcome Measures into Clinical Practice

It is very pleasing that the publication of comprehensive evidence-based clinical guidelines for the assessment and management of attention deficit hyperactivity disorder (ADHD) (1;2) has been accompanied by increased interest in the use of standardised outcome measures in routine clinical practice. However, whilst there is now a plethora of measures available to assess a wide range of outcomes, obtaining accurate and reliable measurement of outcomes is not as simple as it may first appear. Whilst issues of validity and reliability are certainly not going to be at the top of the agenda for most clinicians it is very important to be aware that the results of instruments that either do not truly measure what they purport to measure, or do so in an unreliable way are, at the very least, clinically unsound and may, in certain situations, place patients at risk. Clinicians should therefore make sure that the instruments that they are using have been properly developed and have established validity and reliability. This brief paper will review some of the recent research findings relating to the use of various outcome measures in ADHD, highlighting some recent advances as well as some potential pitfalls. Whilst we hope that these comments will help clinicians think about how best to measure outcomes in their day-to-day clinical practice, this certainly should not be seen as a systematic review of the field. For those interested in exploring the available assessment scales in more detail, the recent book by Kollins and Sparrow provides an excellent and detailed discussion (3).

For most clinicians the main, but certainly not only, therapeutic outcome of interest when managing ADHD is the change in core symptoms. Until recently most clinicians, and indeed clinical trials, used questionnaires completed by the parent and sometimes the teacher, such as those produced by Conners (4) or DuPaul (5). However, despite these questionnaires having excellent psychometric properties, many researchers and clinicians have noted that when they ask the parent about symptom severity there are often significant discrepancies between their own clinical impressions and the scores of the self-completed questionnaires. Anecdotally, from our own clinical practice it appeared

that parents and teachers were sometimes using the questionnaires to communicate an overall message, perhaps because they were worried that if they did not take this opportunity to let the doctor know how difficult things were they might not have another opportunity. Whatever the reason, clinical trials have now almost universally started to use DSM-based symptom questionnaires, like the ADHD Rating Scale IV (ADHD RS-IV) (5) or cut-down versions of the SNAP-IV Rating Scale (6), as clinician-rated semi-structured interviews, with the clinician eliciting the symptoms from the parent and child, and then making their own judgment regarding severity. Importantly, the ADHD RS-IV, when used this way by clinicians (as opposed to experienced researchers) was found to be both valid and reliable in an observational study of ADHD in routine clinical practice that included patients from 10 European countries (7). Used this way, these instruments take between 10 and 15 minutes to complete, depending on the level of complexity of the individual case, but they allow the clinician to obtain a much clearer picture of current symptoms. We have been using the 18 ADHD symptom questions from the SNAP-IV (http://www.adhd.net/) routinely at every visit to our own clinic for several years. Whilst it was initially somewhat dispiriting to find that our patients were not doing quite as well as we had thought (in our experience using the instruments this way tends to pick up more untreated symptoms than using parent-rated questionnaires), it has allowed us to tailor treatments individually in a much better way. This has resulted in significantly improved outcomes. More recently we added in the oppositional defiant disorder questions, and now ask about these before addressing ADHD symptoms, as we feel this allows parents to vent their concerns about oppositional behaviours without those concerns spilling over into the ADHD part of the interview.

An important question to answer, when measuring outcome using one of these scales, is: "How much change is good enough?" There are two parts to this question.

1. How much does a score need to change in order for this change to be clinically relevant (i.e. has the patient improved)?

2. Below what score can I assume that the patient is within the normal range (i.e. have they improved enough)?
Using statistical techniques first devised by Jacobson and Truax (8) to evaluate psychotherapy outcomes and data from our own clinic as well as that from a European observational study we have calculated that a drop in total ADHD RS-IV (or SNAP-IV) of ≥ 11 suggests a significant treatment response whilst a total score of ≤ 24 (mean symptom score ≤ 1.3) puts a patient within the normal range (not the same as being symptom free but a useful first target for symptom reduction).
In our clinic we have recently started to use the SNAP-IV as a semi-structured telephone interview with teachers, both as a part of the assessment process and, when required, to clarify clinical response to treatment in the school setting. In general, however, we have found that, for monitoring treatment response, instruments targeted more specifically at the school situation have greater face validity with teachers and are therefore more readily accepted; they are also more sensitive to change than the generic DSM-based instruments. For this purpose we particularly like the SKAMP, a brief teacher-reported questionnaire originally designed for use in laboratory school studies. It is reliable and valid (9;10), brief, easy to score and easy to interpret.

All of the instruments described so far are focused on rating problem behaviours. As such they tend to ask the rater to choose a score somewhere between "no problems" and "extreme problems". It is now becoming much clearer that ADHD is dimensional and to reflect the range of behaviours seen across a population properly, it is more accurate to consider rating measures such as ability to concentrate, degree of inhibitory control and ability to regulate activity levels as "well above average" through "average" to "well below average". Swanson and colleagues correctly argue that this is an important distinction, as the use of traditional questionnaires like the SNAP-IV or ADHD-RS as a part of the assessment process will tend to over-identify those individuals at the extreme end of the continuum. They developed the Strengths and Weaknesses of ADHD-symptoms and Normal-Behaviors (SWAN http://www.adhd.net/), a questionnaire that aims to capture the full range of behaviours and results in a normal distribution of scores rather than the truncated and skewed scores one sees when a traditional symptom measure is used in a normal population (11). Whilst these are important and valid arguments, particularly if using questionnaires to identify ADHD within a population, we believe that

the traditional measures discussed above are still currently of greater value when measuring treatment outcomes.

ADHD rarely presents in its pure form in clinical settings; most individuals have at least one comorbid problem. Even those with "pure" ADHD will, by definition, have multiple impairments across a range of settings. Clearly, limiting measurement only to symptoms and symptom change would result in a very one-dimensional picture of a patient's problems/difficulties and would be unlikely to identify areas of strength. In addition to assessing comorbid problems and using appropriate outcome scales to measure these, it can also be very helpful to consider using measures of impairment and quality of life (QoL). Tools to assess these two related but distinct concepts have been the focus of considerable research activity recently. In part, this is a response to the requirements imposed by regulators and commissioners on the pharmaceutical companies. The pharmaceutical companies are now being asked not only to demonstrate that their new product is effective, tolerable and safe but also that they are clinically effective and cost effective in the real world, both in an absolute sense and in comparison to other drug treatments (12). Whilst it is appropriate to retain a degree of scepticism about such claims, the tools that have been developed to assess both impairment and QoL can be useful in both research and clinical settings (13).

Impairment refers to an objective assessment of the impact of a disorder on functioning, whilst QoL is the subjective self-perception of one's own well-being (health related QoL is used to describe the impact of a disease or disorder on this sense of well-being). Both impairment and QoL can be measured using either generic or disorder-specific measures. Disorder-specific measures maximise sensitivity and are especially valuable for measuring treatment effects and change (14). Generic measures are more comprehensive in their cover but are less likely to be sensitive to treatment-related change. Generic measures do, however, allow comparison between different disorders across different patient groups and are potentially very useful for commissioning and planning services (15). For planning individual treatment, combined disease-specific and generic measures may be the most appropriate.

The Children's Global Assessment Scale (CGAS) (16) is a quick and easy-to-use generic measure of impairment that, in our opinion, should be used at every visit for all children being seen by health services for mental health problems. The Weiss Functional Impairment Rating Scale (WFIRS; available from the Canadian ADHD Resource Alliance [CADDRA] website http://www.caddra.ca/) is a validated, disorder-specific tool for measuring ADHD-related impairment that is available in both parent and self-report versions. Whilst there is one validated ADHD-specific QoL measure (the ADHD Impact Module [AIM]) its use is limited by cost. Fortunately there are several other generic measures of QoL that have been demonstrated to be valid, reliable and sensitive to change (14). These include the Child Health Illness Profile Child Edition (CHIP-CE), http://www.childhealthprofile.org/index.asp?pageid=49, which has been shown to be sensitive to the QoL impairments associated with ADHD as rated by parents (17), and to a lesser degree patients (18) as well as the treatment-related changes in QoL (18). The Pediatric Quality of Life Inventory (PedsQL), www.pedsql.org/, is another slightly shorter, generic measure of QoL that has also proved useful in ADHD research and that could be considered for use within the clinic (19).

Whilst space does not allow a full discussion of other, potentially important measures of outcome, such as those relating to adverse effects, safety or cognitive performance we would like to highlight one finding from our own research which, if replicated, may have a significant impact on how we understand ADHD and measure outcomes. In a neuropsychopharmacological study investigating the effects of methylphenidate on cognitive and clinical outcomes (20) we identified that ADHD is associated with a range of cognitive deficits. Treating these previously stimulant-naive boys with methylphenidate resulted in the expected clinically important reduction in symptoms for around 70% of subjects as well as striking improvements in cognitive performance on some, but not all, of the tasks with which they had previously struggled. What was surprising was that the improvements in clinical and cognitive functioning were not correlated with each other (i.e. those that improved clinically did not necessarily improve cognitively). If we had only measured either symptoms or cognitive performance we would have missed some important medication effects. On the one hand

these findings underline the importance of measuring change across a range of different aspects of functioning whilst on the other they remind us of the complex relationships between different aspects of functioning and raise questions about whether the current DSM description of ADHD fully describes the problems faced by those who suffer from this important condition. Unfortunately the assessment of cognitive functioning in ADHD is not well standardised and considerable further work is required before clear recommendations can be made regarding the use of neuropsychological testing within routine clinical practice.

Conclusions

Different outcome measures should be used for different purposes in the assessment of ADHD and in monitoring response to treatment. Some suggested scales for these different purposes are summarised in the table that follows.

Table 1: Instruments to consider using in routine clinical practice for monitoring treatment in ADHD

Domain of interest	Measure/instrument	Suggested Rater
ADHD Symptoms	ADHD-IV rating scale (5)	Clinician (based on all available information)
	SNAP-IV (ADHD and ODD sections (6)	Clinician (based on all available information)
	SKAMP (9; 10)	Teacher
Impairment - generic	CGAS (16)	Clinician
Impairment – ADHD specific	WFIRS (http://www.caddra.ca/)	Parent Self
Quality of Life	CHIP-CE (17; 18)	Parent Self
	PedsQL (19)	Parent Self

GP Comment.

What have I learned from this paper?

1. The findings from research using outcome measures have confirmed that ADHD itself is a condition that can involve impairment in several different areas of functioning, even before any comorbidities are considered.

2. It is particularly interesting to know that improvement in one area does not necessarily correspond to improvement in another when ADHD is treated. For example, it seems that improvement in cognition might or might not be related to improvement on measures of quality of life.

3. This paper makes it clear that some of the outcome measures used for ADHD are very easy and quick to use. This makes me wonder whether I can expect my colleagues in child and adolescent psychiatry to provide me with specific results of outcome measures each time the child with ADHD visits the clinic and whether those results will reflect real changes in quality of life for the family.

Dr Tom Inskip, GP, Bedford.

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Declaration of Interest

Company	Relationship/Interest
Flynn Pharma	Advisory board Honoraria for speaking
Janssen Cilag	Advisory board Honoraria for speaking
Lilly	Research funding Advisory board Honoraria for speaking
Medice	Honoraria for speaking
Novartis	Honoraria for speaking
Pfizer	Advisory board
Schering-Plough	Advisory board
Shire	Research Funding Consultancy Advisory Board Honoraria for speaking
UCB	Advisory Board Honoraria for speaking