316

Ellis-Jones J[1], Bevan W [1], Matharu G[2], Assassa P [3], Abrams P[1]
1. BRISTOL UROLOGICAL INSTITUTE, 2. SOLIHULL HOSPITAL, 3. PINDERFIELDS GENERAL HOSPITAL

QUALITY CONTROL: A COMPARISON OF URODYNAMIC TRACES BEFORE AND AFTER ATTENDANCE AT AN ESTABLISHED URODYNAMIC COURSE

Hypothesis / aims of study

Quality control is an important part of all urodynamic investigations and it can help to distinguish between a good quality recording and a poor quality recording (1). Previously, a review of one centre's urodynamic traces, which assessed quality control, found that significant defects were not uncommon (2). There is an increasing awareness of the importance of these measures both nationally and internationally, which has implications for good urodynamic practice and also in our ability to meet the requirements of clinical governance. The purpose of this study was to compare the quality control of urodynamic traces before and after attending a well established, three day combined theoretical/practical urodynamic course.

Study design, materials and methods

The comparison was undertaken on a multi-disciplinary team of four, from one department, who attended the course at the same time. It was recognised by the team, with their consent, that we were presented with an ideal opportunity to compare traces before and after a training intervention. The team were identified as operators – A, B, C, & D to maintain their anonymity. A protocol based on earlier publications (1, 2 & 3) was designed to assess each trace for quality control. This produced a checklist of ten trace characteristics and parameters to be observed during the review and included baseline pressure measurements, equal transmission of pressure, annotation of trace, evidence of troubleshooting, and regular coughs – during fill and after voiding. To meet the study criteria the urodynamic investigations for review had to be around six months pre- or post-urodynamic certificate course. In total, 144 traces were received (blinded). Two reviews were undertaken separately to assess the collective changes and also the individual changes within the multi-disciplinary group. The traces were unblinded by date sequence after they were reviewed. The same urodynamic equipment and disposables were used for all of the investigations. There were two reviewers (also enabling us to test interrater reliability as part of the process of an external review), who have a combined urodynamic experience of twelve years (nine and three respectively). The reviewers also kept notes during the review to identify any other emerging themes or unexpected findings.

Results

Of the traces received, 124 were evaluable – traces were excluded due to error in duplication of the report or if they failed to meet the study criteria. The breakdown into pre-course (n=71) and post-course (n=53) traces revealed some significant findings (Table 1) that were identified as 'problem' areas or negative trace characteristics, which were consistent in both, pre- and post-groups.

Table 1: Comparison of negative trace characteristics and frequency of occurrence (%)

Trace Characteristic	Pre course (n=71)	Post course (n=53)
Unequal transmission of pressure (Pves/Pabd)	63%	42%
Insufficient coughs during recording	70%	60%
No cough after voiding	59%	47%
Transducers zeroed to bladder	11%	0%
Pressure line expelled or displaced during void	24%	8%

There were positive findings/comments in all but 5 (n=124) of the traces that were considered to be of a very poor quality. All of the traces were well annotated, and the initial set-up and recording of resting pressures were generally within the normal acceptable parameters in both groups (>95%). There was little change in the amount of troubleshooting, evidence of which only occurred in 8% of traces pre course and 11% post course.

A further review to assess individual improvement found that there were noticeable differences in overall improvement (Table 2), and in the quality control of the tests they were operating.

Table 2: Comparison of mean individual/operator improvement in quality control of urodynamic traces (%)

Urodynamic operator	Individual breakdown of pre course traces (n=71)	Individual breakdown of post course traces (n=53)	Mean individual improvement (%)
A	13	6	31%
B	32	15	3%
C	8	20	15%
D	18	12	26%

The reviewers were well matched in their trace observations and made similar additional comments which highlighted that where traces had insufficient coughs, the quality could still be assessed on the overall appearance of the trace

and vice versa. Catheters/pressure lines were expelled or displaced frequently during the voiding phase and there was limited evidence of troubleshooting.

Interpretation of results

The comparison of these results shows an overall improvement in the quality control of urodynamic traces within one multi-disciplinary group following a theoretical/practical urodynamic certificate course. There was a variable mean range of individual improvement of 3% -– 31%. The main problem areas, which were consistent in both pre- and post-groups were predominantly unequal transmission of pressure, insufficient coughs and absence of a cough after voiding. Although these showed improvement they were still occurring in >42% of urodynamic investigations after the group had attended the course. The reduction in the amount of expelled or displaced catheters/pressure lines may reflect improved catheter placement and taping techniques, which are covered and discussed during the course. A key aspect of any urodynamic investigation and its relationship with quality control is the ability of the operator to troubleshoot, as this in itself demonstrates knowledge and an understanding of quality control before, during and after a test. In this review there was only a minimal change (3%) observed in troubleshooting ability after the course. This finding is difficult to interpret due to varying levels of operator experience, with an unequal distribution of traces between them, and the limitations of an external review where any extraneous variables cannot be taken into account. In also important to recognise that where operators are more experienced they may not perform as many quality control checks as they should because they are more confident in the overall quality of the trace.

Concluding message

We were in a unique position to show that attendance at an established theoretical/practical urodynamic course improves the quality control of urodynamic traces. Training and practice should also be combined with adequate supervision and individual assessment, which is provided by experienced operators.

References

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