What’s the best approach to peri-operative cortisol assessment & steroid replacement in patients undergoing transphenoidal pituitary surgery?

A. Tariq, D. Bhatt, A.J. Graveling, P. Abraham, M. Kamel, S. MacRury & J.S. Bevan

1Department of Endocrinology, Aberdeen Royal Infirmary, Aberdeen, AB25 2ZU, UK
2Department of Endocrinology, Raigmore Hospital, Inverness, IV2 3UJ, UK
3Department of Neurosurgery, Aberdeen Royal Infirmary, Aberdeen, AB25 2ZU, UK

Background: There is considerable variation in the peri-operative management of glucocorticoid replacement in patients undergoing pituitary surgery. We evaluated the safety and effectiveness of the protocol followed in Aberdeen (UK).

Aim: To evaluate the safety of using pre-operative short Synacthen test (SST) or basal cortisol levels to guide peri- and post-operative steroid replacement in patients undergoing transphenoidal surgery.

Methods: We evaluated 30 patients who underwent pituitary surgery for pituitary adenoma in Aberdeen (2013-2014), excluding those with Cushing’s disease.

We followed our local peri-operative steroid protocol based on pre-operative SST (ITT) and basal cortisol results:

Peri-operative hydrocortisone was given if basal cortisol <450nmol/L, peak cortisol with SST <550nmol/L or steroid status was unknown.

Patients not receiving peri-operative hydrocortisone had serum cortisol checked on a daily basis (at 8-9am) for 3-5 days.

Data were gathered from paper notes and electronic records concerning peri-operative, immediate post-op and 6-8 week post-op cortisol assessment and management.

Results:

1. Type of Pituitary adenoma (n=30)
   - Cushing’s, 2
   - Acromegaly, 5
   - NF Pituitary adenoma, 23

2. Results of pre-operative evaluation (n=22)
   - Short Synacthen Test
     - Sufficient: 15
     - Insufficient: 7
   - Basal cortisol
     - Sufficient: 5
     - Insufficient: 15

3. Results of pre-operative evaluation (n=28)
   - Sufficient Group (n=12):
     - Insufficient Group (n=12):
       - Insufficient after SST: 5
       - Clearly Insufficient after basal cortisol (< 100 nmol/L): 1
       - Insufficient after basal cortisol: 4
       - Unknown: 2 (assumed insufficient)
   - Already on steroids (n=4)

4. Immediate steroid management post-op
   - Insufficient Group (n=12):
     - Insufficient after SST: 5
     - Clearly Insufficient after basal cortisol: 1
     - Insufficient after basal cortisol: 4
     - Unknown: 2 (assumed insufficient)
   - Already on steroids (n=4):
     - All continued on steroid replacement
     - All continued on steroid replacement
     - 2 – sufficient
     - 1 – insufficient, On post-op early morning cortisol monitoring 2 days after surgery
     - Insufficient after steroids stopped 48 hours post-op and monitored early morning cortisol
     - Insufficient on clinical grounds, All continued on steroid replacement

5. Immediate steroid management post-op – on monitoring of early morning cortisol for 3-5 days
   - Sufficient Group (n=12):
     - Steroid sufficient: 7
     - Steroid insufficient: 4
   - 1 patient received dexamethasone post surgery by neurosurgeons

6. Early morning post-operative cortisol levels (sufficient group)

7. Immediate post-op results (all 28)
   - Steroid sufficient: 10
   - Steroid insufficient: 18

8. Results of Post-op review with SST (typically 6 weeks)
   - Steroid sufficient group (n=20)
   - All patient remained steroid sufficient: 10
   - Steroid sufficient: 6
   - Borderline: steroid cover for intercurrent i.e. Bra-2
   - Steroid insufficient: 4
   - Patient on long term steroid (not assessed) = 3

Conclusions:

1. Short Synacthen test is helpful in the assessment of pre-operative cortisol status.
2. If SST is not available, basal cortisol can be used but a relatively high safety bar is advisable (450nmol/L).
3. Early morning cortisol monitoring is useful in post-op patients deemed steroid sufficient pre-operatively and also in patients where cortisol has been stopped for 48 hours post-surgery.
4. All patients discharged without cortisol replacement post-operatively remained steroid sufficient at 6-8 week assessment (100% safety).
5. Fifty-percent of patients given temporary steroid replacement post-surgery were able to discontinue replacement after the 6-8 week assessment.

Contact: adnan.tariq@nhs.net