York Teaching Hospital NHS
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An Audit of Epidural Effectiveness and Anaesthetic Experience

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Introduction

The introduction of formal appraisal for anaesthetists has recently led to anaesthetists requesting individual data on epidural effectiveness from our acute pain service. At a similar time there has been a reduction in the use of epidural analgesia following the increase of enhanced recovery-this raised the question whether success was related to the number of epidurals placed.

Current published data suggests that the failure rate for epidural analgesia is between 27-32%[1]. We wished to look in detail at the epidural infusion outcomes for surgical patients at York hospital including factors which may influence failure.

Methods

All patients with an epidural infusion are reviewed on a daily basis (7 day week) by the acute pain team. We reviewed data for epidurals sited over the period of one year including those by consultants, non career grades and trainees.

The standard York Hospital epidural mix comprises bupivacaine 0.125% + fentanyl 4mcg/ml with a 6 ml bolus nurse administration option.

Data collected included ASA, operation, level of insertion and length of catheter in space, pain scores (rest and movement) side effects (pruritus, nausea, motor block), duration of treatment and failure.

Results

498 epidurals were sited by a total of 56 different anaesthetists. These were divided into 3 groups according to the number of epidurals sited by each anaesthetist:

	Number of anaesthetists	Number of epidurals
Group 1 >20 epidurals	7	204
Group 2 10–20 epidurals	15	192
Group 3 <10 epidurals	34	102

Results

Table 1. Patient details

	Average patient age	Average ASA grade	% Elective cases
Group 1 >20 epidurals	65	2.3	55
Group 2 10 -20 epidurals	64	2.1	75
Group 3 <10 epidurals	65	2.4	83

Table 2. Speciality per no. epidurals

	General	Urology	Ortho/ trauma	Gynae
Group 1 >20 epidurals	199 (97.5%)	4 (2%)	1 (0.5%)	0
Group 2 10-20 epidurals	151 (79%)	34 (17.5%)	4 (2%)	3 (1.5%)
Group 3 <10 epidurals	77 (75.5%)	19 (18.5%)	3 (3%)	3 (3%)

Table 3. NRS scores at 24 hours postop

	Average NRS rest	Average NRS movement
Group 1 >20 epidurals	1.35	2.81
Group 2 10-20 epidurals	1.26	3.05
Group 3 <10 epidurals	1.42	3.25

Figure 1. Epidural insertion level

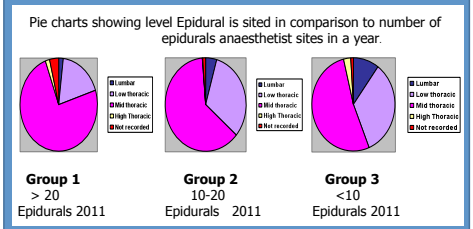
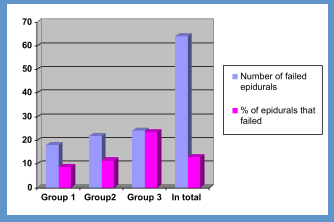


Table 4. Length of catheter in space

	Average cms catheter in space cm (range)	No. epidurals <4cms in space	No. epidurals >5cms in space
Group 1 >20 epidurals	4.54 (3-8)	8 (3.9%)	15 (7.4%)
Group 2 10-20 epidurals	4.63 (2-7)	13 (6.8%)	26 (13.5%)
Group 3 <10 epidurals	4.57 (2-7)	5 (4.(%)	14 (13.75)

Table 5. Failure rate



Discussion

Failure rate was defined as an NRS at 24 hours of NRS 7 and above/ patient rated epidural as poor or fair overall and/ or pain overall as distressing or excruciating. Failure (table 5) was lowest in group 1 at 8.8% and highest in group 3 at 23.5%. As expected this suggests a correlation between experience and quality of analgesia. Current literature suggests that PCEA with background infusion can reduce total dose of local anaesthetic, patient satisfaction and incidence of motor block. Our data shows 28 (5.6%) of all patients were converted to PCEA due to sub optimal analgesia.

Insertion level was lower in group 3 (figure 1). This correlates with the increased incidence of motor block in the same group. Thoracic epidural space identification has been shown to have a higher failure rate and anaesthetists in group 3 may be less confident inserting higher thoracic epidurals which may be perceived to be more technically difficult.

Epidural catheters should be inserted at least 4cms into the epidural space-one recent study has recommended at least 5cm to prevent fallout. Our data (table 4) shows an average insertion length of 4.54-4.63cms with a range of 2-8cms, which may account for failure due to fall out or catheter migration through an intervertebral foramina.

Catheters were fixed with a clear dressing and Mefix or Leukoplast Sleek tape. The majority of fallouts occurred on the planned day for discontinuation, however there remains scope to look at alternate methods of fixation including tunnelling and catheter fixation devices. There are currently no studies comparing fixation devices with tunnelling.

Conclusion

The incidence of epidural failure rate is hampered by lack of uniform outcome measures. Current evidence suggests a rate of 27-32% and although our data shows an overall failure rate of 12.8% further improvements can be made with respect to the use of PCEA, epidural insertion levels and catheter fixation.

Acknowledgement

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References

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