



## ORIGINAL RESEARCH

### ACUTE PAIN SERVICE ORGANIZATION

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#### ABSTRACT

**Objective:** The aim of this retrospective study was to evaluate the organization of acute pain service of Marmara University Hospital, and the efficacy, side effects and complications of the analgesic methods used between september 2003-2004.

**Materials and Methods:** Data sheets of the postoperative pain survey of 3190 patients treated by the acute pain service were examined retrospectively between September 2003 and 2004. Analgesic methods used and complications related to them, numeric rating scale (NRS) scores, TORDA scores and patient's satisfaction were recorded.

**Results:** The incidence of additional analgesic requirement (NRS>3) in epidural intermittent group were higher than the other groups (p<0.05). The incidence of nausea and vomiting were higher in intravenous patient controlled analgesia and epidural patient controlled methods compared to other groups. Pruritis was less prominent in parenteral intermittent group compared to other groups. 98 % of the patients were satisfied with the analgesic method performed.

**Conclusion:** Acute pain service organization provides maximum satisfaction either in patients treated with invasive methods such as regional blocks or in patients treated with simple and noninvasive methods such as the administration of parenteral / oral non-steroidal anti inflammatory agents and opioids.

**Keywords:** Analgesia: postoperative. Anesthetic techniques: epidural. Pain: acute pain service

### AKUT AĞRI SERVİSİ ORGANİZASYONU

**Amaç:** Bu retrospektif çalışmada, Marmara Üniversitesi Hastanesi Akut Ağrı Servisi organizasyonunun ve Eylül 2003-2004 tarihleri arasında uygulanmış olan analjezik metodların etkinlik, yan etki ve komplikasyonlarının değerlendirilmesi amaçlanmıştır.

**Yöntem:** Eylül 2003 ve 2004 tarihleri arasında akut ağrı servisi tarafından tedavi edilen 3190 hastanın postoperatif ağrı formları retrospektif olarak incelenmiştir. Uygulanan analjezik metodlar ve bu metodlara bağlı gelişen komplikasyonlar, nümerik derecelendirme skalası (NRS) skorları , TORDA skorları (açık hali söylenmeli) ve hastaların memnuniyetleri kaydedilmiştir.

**Bulgular:** Aralıklı epidural grubundaki hastaların ek analjezik gereksinimleri (NRS>3) diğer gruplardaki hastalardan belirgin yüksek bulunmuştur (p<0.05). İntravenöz ve epidural hasta kontrollü analjezi metodlarında bulantı kusma insidansı diğer gruplara göre belirgin yüksek bulunmuştur. Kaşıntı insidansı, aralıklı parenteral grubunda diğer gruplar ile karşılaştırıldığında belirgin azalmıştır. Hastaların % 98' i kendilerine uygulanan analjezi metodundan memnuniyet bildirmişlerdir.

**Sonuç:** Akut ağrı servisi organizasyonu; etkin postoperatif ağrı tedavisi yapılabilmesinin, özellikle bölgesel bloklar gibi ciddi yan etki ve komplikasyonları olan yöntemlerin güvenli uygulanabilmesinin yanısıra en sık kullanılan ve en basit yöntem olan aralıklı NSAI+opioid uygulamasında bile yüksek oranda hasta memnuniyeti sağlanabilmesinin gerek ve yeter şartıdır.

**Anahtar Kelimeler:** Analjezi: postoperatif. Anestetik teknikler: epidural. Ağrı: akut ağrı servisi

#### INTRODUCTION

Management of perioperative analgesia is required for humanitarian reasons as well as for decreasing postoperative morbidity and mortality<sup>1-5</sup>. Many patients undergoing surgery are still suffering from pain postoperatively, despite the development of new analgesic agents and techniques<sup>6</sup>. The reason for this fact usually depends on the disorganizations, discoordinations and lack of pharmacological

knowledge of medical practitioners in providing adequate analgesia during the postoperative period<sup>6</sup>.

Acute pain treatment is said to be effective if it decreases postoperative morbidity such as respiratory complications or myocardial infarction, and length of hospital stay and if it provides optimal comfort and prevents complications related to the treatment<sup>1-5</sup>. Acute



pain service organization has been developed for the effective control of acute postoperative pain<sup>5,7</sup>. Its existence depends upon the ongoing training of medical staffs in methods of postoperative pain management, research and application of new analgesic methods.

Anesthesiologists are skilled in the systemic administration of analgesics and are more experienced in the application of regional techniques perioperatively, because they are more familiar with the pharmacology of analgesics and the anatomy of the pain pathways. Therefore the members of acute pain service should always be anesthesiologists<sup>7-8</sup>. In our hospital, acute pain service has been organized in September 2003 by the Anesthesiology Department.

The aim of this retrospective study was to evaluate the organization of acute pain service of Marmara University Hospital and the efficacy, side effects and complications of the analgesic methods used between September 2003-2004.

#### METHODS

The data sheets of the postoperative pain survey of 3190 patients who were treated by the acute pain service between September 2003 and 2004 were examined retrospectively. Demographic characteristics, type of surgery, comorbid diseases, analgesic method used, complications related to the analgesic methods, hemodynamic parameters, respiratory rate, NRS (numeric rating scale) scores at rest, TORDA scores (0= no pain with coughing; 1= pain with coughing but no pain with deep inspiration; 2= pain with deep inspiration but no pain in rest; 3= pain in

rest), sedation scores, side effects such as nausea, vomiting, pruritis, urinary retention, headache, and patient's satisfaction were recorded.

Data are expressed as percentage. Statistical significance was checked by setting the level of significance at  $p < 0.05$ . Data collected were analyzed with Fisher's exact test for detection of significant differences between groups.

#### RESULTS

Acute pain service team consists of an associate professor, a resident standing in the recovery room, a resident assigned to the service for 2-month and an anesthesiology technician assigned to the service for 1-month rotations (Fig. 1).

The entire team makes clinical rounds on each patient who has received any of the postoperative analgesia methods, twice a day, each morning and each afternoon. After the admission of the patient to the ward, clinical rounds are repeated in every two hours during the first 8 hours and in every 4 hours thereafter. During these rounds, numeric rating scale scores of the patients and TORDA scores with coughing and activity, side effects and patient's satisfaction scores, sensorial and motor blocks are evaluated and recorded. The site of insertion of each catheter is inspected. These recordings are made by the anesthesiologist on call during the off work hours.

The written analgesic treatment protocol has been defined according to the type of surgery and comorbidity of the patient. The surgical disciplines have been informed about the protocols.

### ACUTE PAIN SERVICE TEAM

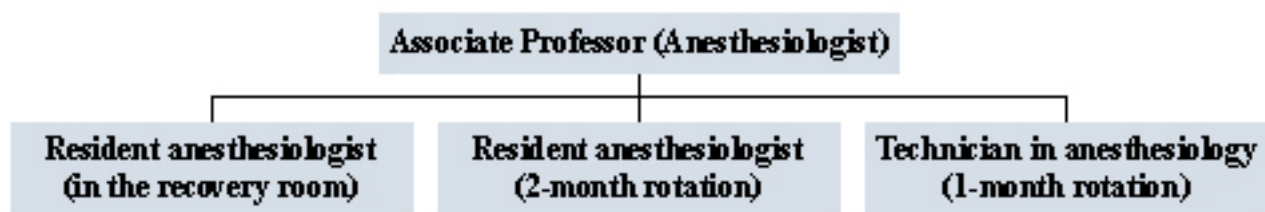


Fig. 1: Acute pain service team



Postoperative analgesia begins in the recovery room. The type and dose of analgesic which is planned to be administered, are written to the analgesia sheet of the patient; and the first analgesic dose is administered in the recovery room. When the patient's NRS score is less than 3, he or she is referred to the ward.

Postoperative pain management is done by one of the following methods:

- 1 Systemic administration of opioids with constant intervals
- 2 Intrathecal or epidural opioids and/or local anesthetics as needed
- 3 Intravenous or epidural patient controlled analgesia (PCA).

Every patient in each method receives intravenous, thereafter oral non-steroidal anti inflammatory agents and/or oral paracetamol.

52 % of the 3190 patients were male and 48 % were female. 16.3 % of the patients were less than 10 years old, 76.1 % were between 10-75 years old and 7.6 % were greater than 75 years

old ( the youngest patient was 10 months old and the oldest patient was 88 years old).

The percentage of patients treated by the acute pain service at each surgical department were expressed in Table I.

The characteristics of the analgesic methods used were expressed in Table II.

The need for additional analgesic was described as NRS > 3. The overall incidence of NRS > 3 was 7.8 % in all analgesic methods.

Side effects of the analgesic methods were expressed in Table III.

Three patients who had epidural anesthesia had accidentally dural puncture, 11 had a disconnection of the filter from the epidural catheter, 2 had catheter dislodgement and 6 patients had insufficient analgesia. In the latter, intravenous patient controlled analgesia was performed. 98 % of the patients were satisfied with the analgesic method performed.

**Table I:** The percentages of patients involved in the surgical departments

Surgical Departments	%
General surgery	22
Urology	18
Orthopedic Surgery	16
Ear-Nose-Throat Surgery	15
Plastic Surgery	8
Gynecology	7
Neurosurgery	6
Pediatric Surgery	5
Thoracic Surgery	3

**Table II:** The characteristics of the analgesic methods

	Intravenous PCA	Epidural PCA	Epidural intermitten t	Parenteral intermitten t	Caudal	Intrathecal opioid
Patient's number (n)	359 (14.4)	161 (7)	149 (6)	1477 (59)	205 (8.2)	170 (6.8)
(%)						
Follow-up time (hrs)	72.8	98	50	47	33.9	34
TORDA > 1 (n)	167 (53.5)**	40 (25)	112 (75)*	337 (23)	50 (25)	48 (28)
(%)						
NRS > 3 (n)	52 (14.5)	10 (6.2)	95 (63.8)#	108 (7.3)	20 (10)	23 (13.5)
(%)						

\* p < 0.05, compared to all groups.

\*\* p < 0.05, compared to epidural PCA, parenteral intermittent, caudal and intrathecal opioid

# p < 0.05, compared to other groups.



**Table III: Side effects (%)**

	Intravenous PCA	Epidural PCA	Epidural intermittent	Parenteral intermittent	Intrathecal opioid
Nausea vomiting	28*	27.5*	14.5	9	15.3
Pruritis	13.4**	18**	8	1.7	10**
Sedation	0	0	0	0.3	0
Parestesia	-	1.7	0.6	-	-
Urinary retention	0	0	12***	0.5	0
Headache	0	0	0	0	0.5

\* p < 0.05, compared to epidural intermittent, parenteral intermittent, intrathecal opioid

\*\* p < 0.05, compared to parenteral intermittent

\*\*\* p < 0.05, compared to other groups

## DISCUSSION

The results of this study reveals that acute pain service organization is indispensable for the effective control of acute postoperative pain control. Acute pain service organization provides maximum satisfaction either in patients treated with invasive methods such as regional blocks or in patients treated with simple and noninvasive methods such as the administration of parenteral / oral non-steroidal anti inflammatory agents and opioids.

In spite of increasing interest and publications in the understanding of mechanism and management of chronic pain, ineffective management of postoperative analgesia is still a great problem in Turkey as well as in other countries of the world<sup>9</sup>. The first acute pain services have been organized in 1985, in the United States and in Germany<sup>7,10,11</sup>. Nevertheless, despite 20 years passed, it is not easy to realize that many centers do not still have their own acute pain services and that many patients all over the world still receive inadequate postoperative analgesia. The reason for this problem seems to be multifactorial. First of all, close postoperative follow-up of the patient's pain scores and side effects related to the analgesic method used, requires appropriate education, time, effort, increased specialist supervisor and specially dedicated medical staff<sup>6</sup>. Secondly, nurses or doctors involving in the postoperative pain management should not be resistant to changes in this field and should not be in a tendency to underestimate patient's pain.

We found that the overall incidence of the need for additional analgesic described as NRS > 3 was 7.8 % comparable to 10.9 % in the published datas<sup>12</sup>. Regarding the analgesic

methods used, only the incidence of moderate-severe pain is very high in the intermittent epidural analgesia method when compared with that in the literature. In intermittent epidural analgesia method, epidural injection is done upon the patient's request when he or she perceives pain. This easily explains why this group of patients has high NRS scores. Undoubtly, continous epidural technique will be more satisfactory, however the cost and the incidence of side effects will also increase.

The patient satisfaction was very high in our study, even in the intermittent epidural analgesia group in which the patients' NRS scores were high. In the literature, it is suggested that patient satisfaction is equally expressed in the opioid based intravenous PCA method as in the local anesthesia based epidural method, although epidural analgesia is associated with increased analgesic efficacy<sup>13-15</sup>. This finding means that satisfaction depends more on the length of time spent with the patient rather than the analgesic efficacy.

In our study, side effects related to the analgesic methods used were few. The analgesic methods used are invasive and sophisticated methods and they require close monitorization. The low incidence of the side effects is related to careful and frequent follow-up of the patient's analgesic status by the acute pain service members. So, we can conclude that one of the advantages of this service is that it favors the use of sophisticated analgesic methods during surgery continuing on the wards and it decreases the use of expensive monitorization techniques in the sake of frequent visits on the wards, including the physical and neurological examinations.



There are few centers that have organized acute pain service in Turkey. The organization of this service in our hospital is nearly new and it will be reasonable for us to investigate and make publications during the coming years, whether this organization is going to improve postoperative pain relief, patient satisfaction, and decrease side effects related to the analgesic methods, morbidity, hospital stay and cost issues.

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