

## RETROSPECTIVE EVALUATION OF ANALGESICS PRESCRIBING PATTERN IN A TERTIARY HOSPITAL IN NIGERIA

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### ABSTRACT

The study was designed to retrospectively evaluate the analgesics prescribing pattern in the Accident and Emergency (A and E) Unit of University of Benin Teaching Hospital, Benin City. The data was retrieved from the pharmacy archives type of analgesics and its routes of administration whether oral or parenteral in all prescriptions from January 2000- December 2006. The analysis was done using SPSS version 13.0 and data presented in tabular form.

The total utilization trend in this study showed that analgesic prescription increased over the years except for considered year 2003. The total analgesics utility increment from 2000 to 2006 was 189.5% which was high. Seventeen different types of analgesics were prescribed and utilized. Among them, 8 were utilized orally only, 3 were utilized parenterally only and 6 were used both orally and parenterally for different clinical conditions. Oral administration was more frequently used than parental route. Non-opioid type of analgesics was utilized more than opioid. With oral route being the most favoured route of administration and opioids with exception of tramadol were exclusively administered parenterally. Paracetamol was the commonest prescribed analgesic in accident and emergency department. The result of this study may help to predict the needs of patients thus providing a database for pharmacy stocking template for analgesics to prevent unnecessary donations and purchases. Relevant studies need to be carried out to determine the effectiveness of analgesics in the Accident and Emergency unit of our Centre.

### INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage<sup>1</sup>. Pain is the commonest reason why people seek help and care, yet many individuals suffer with unrelieved or undertreated pain. In

emergency department admissions, acute pain is the most frequent complaint<sup>2,3</sup> and the relief of pain stands as the most common reasons for seeking care in an emergency department<sup>4</sup>. Substantial period of time in medical and dental practice is devoted to prevention, control and treatment of pain. Modalities in management of pain are varied ranging from drugs, acupuncture, hypnosis, electro-analgesia and surgery, but drug therapy is the most commonly used variety. Analgesic has been documented as the most predominantly prescribed drug in a secondary health care facility in Nigeria<sup>5</sup>

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**KEY WORDS:** *pattern, analgesics, prescription, Nigeria, hospital*

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and 12.3% of the total prescription in a primary care setting in South Africa<sup>6</sup>.

Studies revealed that the majority of patients with severe pain seen in the A&E departments will get suboptimal pain relief<sup>7-10</sup>. Availability of analgesics is very important since trauma accounts for majority of accident and emergency cases in Benin. Benefit to the patient will depend on rational analgesic prescription and its availability. Audit of analgesic prescription is vital in identifying the needed analgesic for pharmacy stocking and model for donor agencies in developing countries. Our data was based on prescription emanating from different teams and traumatic conditions with primary aim to relieve pain, irrespective of the cause.

The objective of this present study was to investigate the prescription/utilization pattern of analgesics in accident and emergency department of University of Benin Teaching Hospital, Benin City.

### **MATERIALS AND METHODS**

It was a retrospective study with analyzed data gotten from the pharmacy archives. The period of interest was from January 2000 - December 2006. Data collected was type of analgesics and its routes of administration whether oral or parenteral. The analysis was done using SPSS version 13.0 and data presented in tabular form

### **RESULTS**

The total utilization trend in this study showed that analgesics increased over the years except for the year 2003. The total analgesics utility increment from 2000 to 2006 was 189.5% which was high.

Seventeen different types of analgesics were prescribed and utilized. Among them, 8 were utilized orally only, 3 were utilized parenterally only and 6 were used both orally and parenterally for different clinical conditions (Table I). The p-value=0.9968 (not significant at 95% Confident interval). Oral administration was more frequently used than parental route. Non-opioid type of analgesics was utilized more than opioids, with oral route being the most favoured route of administration. ( $P < 0.05$  (not significant) at 95% confident interval). Opioids, with exception of tramadol were exclusively administered parenterally. Overall, Paracetamol was one of the most commonly prescribed analgesics in Accident and Emergency unit of the University of Benin Teaching Hospital (Table 1).

### **DISCUSSION**

Pain is a central reason for many emergency department visits. Thus reduction of pain and suffering in acute admissions is one of the functions of an Accident and Emergency department<sup>11</sup>. International Association for the Study of Pain (IASP), the European Federation of IASP Chapters, and the World Health Organization in a co-sponsored forum on 11 October 2004 declared that the relief of pain in acute, chronic non-cancer and cancer pain should be a human right<sup>12</sup>.

The total utilization trend in this study showed that analgesics increased over the years except for year 2003 in which there was a lot of labour crisis in the hospital. The total analgesics utility increment from 2000 to 2006 was 189.5% which was high and reflected the high level of medicare

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**Table 1: Prescription Patterns of Analgesics between January 2000 to December 2006 in Accident and Emergency Unit**

ANALGESICS	ROUTE	2000	2001	2002	2003	2004	2005	2006	Total
PENTAZOCINE	P	9,200 (3.14%)	6552 (2.22%)	2201 (0.58%)	16001 (5.59%)	21003 (6.51%)	18002 (4.36%)	20033 (3.60%)	<b>92992</b>
DICLOFENAC	O,P	41006 (13.98%)	41007 (13.88%)	86007 (0.23%)	71002 (24.79%)	91004 (28.22%)	82001 (19.85%)	91121 (16.39%)	<b>503148</b>
KETOROLAC	O,P	--	--	--	--	--	--	14 (0.00%)	<b>14</b>
METAMIZOL	O,P	14000 (4.77%)	6000 (2.03%)	7100 (1.86%)	8106 (2.83%)	8006 (2.48%)	9200 (2.26%)	306 (0.06%)	<b>52718</b>
PARACETAMOL	O,P	204001 (69.53%)	196007 (66.33%)	182000 (47.64%)	142000 (49.57%)	131000 (40.62%)	224006 (54.21%)	33609 (60.44%)	<b>1112623</b>
PIROXICAM	O,P	9200 (3.17%)	5608 (1.90%)	4206 (1.10%)	2001 (0.70%)	4210 (1.31%)	3607 (0.87%)	6019 (1.08%)	<b>34851</b>
TRAMADOL	O,P	12420 (4.23%)	36007 (12.18%)	91000 (23.82%)	36000 (12.57%)	42003 (13.02%)	48341 (11.70%)	71001 (12.77%)	<b>336772</b>
MORPHINE	P	61 (0.02%)	42 (0.01%)	12 (0.00%)	21 (0.01%)	42 (0.01%)	94 (0.02%)	22 (0.00%)	<b>294</b>
FENTANYL	P	--	2 (0.00%)	10 (0.00%)	11 (0.00%)	4 (0.00%)	--	--	<b>27</b>
CELECOXIB	O	65 (0.02%)	118 (0.04%)	96 (0.03%)	--	12 (0.00%)	9 (0.00%)	32 (0.01%)	<b>332</b>
INDOMETHACINE	O	4 (0.00%)	3 (0.00%)	1 (0.00%)	6 (0.00%)	10 (0.00%)	3 (0.00%)	1 (0.00%)	<b>24</b>
NAPROXINE	O	46 (0.002)	21 (0.00%)	62 (0.02%)	76 (0.03%)	11 (0.00%)	48 (0.01%)	36 (0.01%)	<b>300</b>
TENOXICAM	O	--	--	--	--	2 (0.00%)	8 (0.00%)	9 (0.00%)	<b>19</b>
IBUPROFEN	O	42 (0.01%)	9 (0.00%)	81 (0.02%)	106 (0.04%)	1061 (0.33%)	1109 (0.27%)	2061	<b>4469</b>
ACETYLSALICYLIC ACID	O	32 (0.01%)	41 (0.01%)	81 (0.02%)	12 (0.00%)	42 (0.01%)	38 (0.01%)	1030 (0.37%)	<b>1276</b>
<b>TOTAL</b>		<b>290077</b>	<b>291417</b>	<b>372857</b>	<b>275342</b>	<b>298410</b>	<b>386466</b>	<b>225294</b>	<b>2139863</b>

#### ANALGESICS

The experiment is small and the treatment are small, the right design to carry out the significant difference is the complete randomized experiment the advantage is very flexible.

**SUMMARY OF ANALGESICS TABLE**

	2000	2001	2002	2003	2004	2005	2006
TOTAL	290077	295519	372857	275342	298410	386466	225294
MEAN	19338	19428	24857	18356	19894	25764	15020

Find below the Analysis of Variance (ANOVA) using GraphpadInStat Version 3.10

geared toward pain control in our Accident and Emergency unit. Seventeen different types of analgesics were prescribed and utilized. Among them, 8 were utilized orally only, 3 were utilized parentally only and 6 were used both orally and parenterally for different clinical conditions. Oral administration was more frequently used than parenteral route and this is in consonance with the finding of Sepehri et al 2006<sup>13</sup>. Evident from this study, most patients in Accident and Emergency department were conscious and their gastrointestinal tracts were not disrupted; thus prompting oral analgesics prescription. Intravenous analgesia is superior to intramuscular analgesia for reasons of speed of onset, reliability of uptake, and the ability to titrate doses to response. The type of analgesics predominantly utilized in this study was the non-opioid type which was similar to previous study in South Africa in which most analgesic prescriptions were for non-opioid analgesics (93.8%)<sup>6</sup>. A study revealed no use of opioid Analgesia in the Emergency department<sup>14</sup>.

The explanation is the obvious concern of patients and practitioners about opioid addiction potential and this limits its prescription<sup>15, 16</sup>. Other possible reasons for

reluctance to use opioids in healthcare in the literature are patient refusal, worry of masking injuries and complications such as compartment syndrome, fear of side effects and fear of dependence<sup>4, 17</sup>. Opioids remain the agents of choice for severe pain; however, this class of analgesics is associated with dose-dependent adverse effects such as nausea, vomiting, ileus, sedation and respiratory depression. Also, it prolongs the time to readiness for discharge<sup>18, 19</sup>.

Paracetamol also known as acetaminophen, a non-opioid centrally acting analgesic, consistently remained the analgesic of choice during the period of review. In this study paracetamol emerged as the leading analgesic consisting about two-fifth to two-third of prescription during the period of study. Overall, it represented one in every two analgesics utilized in this study. Its highest use was in year 2000 occupying 69.53% and lowest in 2004 at 40.62%. Preference for paracetamol by emergency doctor could be due to its well-established safety, lack of significant drug interactions, few contraindications and multiple modes of administration such as oral (tablet, liquid suspension) and parenteral (intravenous, or intramuscular form)<sup>20, 21</sup>. Paracetamol is generally well

tolerated, lacks many of the side-effects of aspirin and commonly used in fever and headaches. It is also a major ingredient in numerous cold and flu remedies. In recommended doses, paracetamol does not irritate the lining of the stomach, affect blood coagulation as much as non steroidal anti-inflammatory drugs (NSAIDs), or affect function of the kidneys. However, some studies have shown that high dose-usage (greater than 2,000 mg per day) does increase the risk of upper gastrointestinal complications such as stomach bleeding<sup>22</sup>. Paracetamol is safe in pregnancy, and does not affect the closure of the fetal ductus arteriosus as NSAIDs can. Unlike aspirin, it is safe in children, as paracetamol is not associated with a risk of Reye's syndrome in children with viral illnesses. Studies on analgesics efficacy in comparison with other non-opioid analgesics were diverse. A randomized controlled trial of chronic pain from osteoarthritis in adults found similar benefits from paracetamol and ibuprofen<sup>23</sup>. However, a randomized controlled trial of acute musculoskeletal pain in children found that the standard Over-The-Counter (OTC) dose of ibuprofen gives greater relief of pain than the standard dose of paracetamol<sup>24</sup>.

Diclofenac, a non-steroidal anti-inflammatory drug, was second most commonly prescribed analgesic except in 2002 when it was third while tramadol took the second position. The reason is not far-fetched as diclofenac is among the better tolerated NSAIDs. Popularity of diclofenac as an analgesic is due to its multiple indications which include musculoskeletal problems, especially arthritis (rheumatoid arthritis, osteoarthritis, spondyloarthritis,

ankylosing spondylitis), gout attacks, and pain management in case of kidney stones and gallstones. An additional indication is the treatment of acute migraines. Diclofenac is used commonly to treat mild to moderate post-operative or post-traumatic pain, particularly when inflammation is also present, and is effective against menstrual pain. Diclofenac has been found to be effective against all strains of multi drug resistant *E. coli*, with a minimal inhibitory capacity (MIC) of 25 microg/mL thus suggesting that diclofenac has the capacity to treat uncomplicated urinary tract infections caused by *Escherichia coli*<sup>25</sup>.

Tramadol was the third most common analgesic and commonest opioid prescribed. It is a centrally acting opioid analgesic used for treating moderate to severe pain and most types of neuralgia, including trigeminal neuralgia, and it appears to have actions at the  $\mu$ -opioid receptor as well as the noradrenergic and serotonergic systems<sup>26</sup>. Tramadol has a lower risk of respiratory depression and impairs gastrointestinal motor function less than other opioids at equi-analgesic doses<sup>27</sup>. Tramadol, in contrast to typical opioids may enhance immune function<sup>28</sup>. These reasons could explain why it was a highly favoured opioid analgesic in this study.

Pentazocine was the second most common opioid utilized our Accident and Emergency. Piroxicam in 2000 was fourth most common analgesic utilized but its use as years go by, decreased. Tenoxicam and Ketorolac were not used until 2004 and 2006 respectively. A study stated that ketorolac was preferable to acetaminophen

with codeine for the treatment of acute low back pain in the emergency department as early as 1998<sup>29</sup>.

Pentazocine, morphine and fentanyl were the only classical parenteral opioid used with the exception of tramadol, and the route of administration was parenteral only. Morphine utilization in this study was low despite the fact that some authorities have reported morphine as the best analgesic drug in trauma<sup>30</sup>. Yet trauma is the commonest cause of presentation in the Accident and Emergency Department. A significant proportion of patients, however do not require admission<sup>31</sup>.

## CONCLUSION

The result of this study may help to predict the needs of patients, thus providing a database for pharmacy stocking template for analgesics to prevent unnecessary donations and purchases. Extrapolation of this data will be useful in predicting the future Accident and Emergency analgesic utilization capacity.

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