

A SURVEY OF THE KNOWLEDGE ATTITUDE AND PRACTICE  
REGARDING EPIDURAL LABOR ANALGESIA AMONG  
OBSTETRICIANS AT THE KENYATTA NATIONAL HOSPITAL

A DISSERTATION PRESENTED IN PART FULFILLMENT OF THE  
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ANESTHESIA, UNIVERSITY OF NAIROBI

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A SURVEY OF KNOWLEDGE ATTITUDE AND PRACTICE  
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DECLARATION

I declare that this dissertation is my original work and has not been submitted for a degree award in any other university.

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This book is dedicated to the love of my life *Martin Munyole*.

## ACKNOWLEDGEMENTS

I am grateful to the consultants who have provided me with advice and guidance. The principal contributions were from my supervisor *Dr. Mark Gacii* and the head of thematic unit anesthesia department *Dr. Patrick Olang*'

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## LIST OF ABBREVIATIONS

EA.... Epidural Analgesia

ELA... Epidural Labor Analgesia

PCEA... Patient Controlled Epidural Analgesia

CSEA... Combined Spinal and Epidural Anesthesia

PIA... Pregnancy Induced Analgesia

ACOG... American College of Obstetricians and Gynecologists

ASA... American Society of Anesthesiologists

KNH... Kenyatta National Hospital

UON... University of Nairobi

TENS... Transcutaneous Electrical Nerve Stimulation

IASP..... International association for the study of pain

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## ABSTRACT.

### *Background:*

Epidural labor analgesia is the most effective method of pain relief during childbirth and the only method that provides complete analgesia without maternal or fetal sedation. With safer drugs and better equipment its use has steadily increased over the years. It has become a milestone in obstetric analgesia and obstetricians worldwide know about it and use it. This survey looked at the respondents' *knowledge on epidural labor analgesia, their attitude towards its routine use against their ages, gender and years of experience and how often they practiced it at the Kenyatta National Hospital with determination as to whether or not their own personal experience influenced their practice.*

### *Objective:*

To determine the knowledge, attitude and practice of obstetricians regarding epidural labor analgesia at the Kenyatta National Hospital.

### *Research Methodology:*

This study was designed as a cross-sectional descriptive survey. All consenting obstetricians were recruited into the study. Data was collected using a likert –type questionnaire at the labor ward and the obstetrics and gynaecology department of the University of Nairobi. Analysis was done using the Statistical Package for Social Scientists (SPSS) software version 20.0.

Frequencies and crosstabs were used to present the data and chi square test done to look at the relationship and association between variables. Statistical significance achieved with a p-value of  $< 0.05$ .

### *Results:*

Sixty obstetricians were surveyed, with a consultant to registrar ratio of 3:7 and male female ratio of 1:1. Knowledge makers of application ranged from 50-78% in relation to timing, complications and incidence of caesarean section. Only 3% practiced epidural anesthesia often but 81.7% had a positive attitude toward its routine use regardless of age, gender and years of practice with the greatest hindrance being thought to be inadequate equipment.

## OPERATIONAL DEFINITIONS

*Obstetrician-* A medical doctor who specializes in treating pregnant women and diseases of the female reproductive organ. In this context includes both *consultants* - those with post graduate qualifications in obstetrics and gynecology and *registrars* –those undertaking a post graduate training in obstetrics and gynecology.

*Practice-* In this survey the obstetricians' act of recommending the use of epidural labor analgesia plus or minus calling of an anesthesiologist to apply the epidural to the interested parturient.

*Analgesia-* The absence of the sense of pain while remaining conscious.

*Anesthesiologist-* A physician trained in methods of having sensation including the feeling of pain blocked or temporarily taken away.

*Epidural space-* The space forming the outermost part of the spinal canal lying outside the dura mater surrounded by vertebrae, it contains lymphatics, spinal nerve roots, loose fatty tissue, small arteries, and a network of large, thin-walled blood vessels called the epidural venous plexus.

*Spinal anesthesia* also sub-arachnoid block (SAB) - Is a form of regional anesthesia involving injection of a local anesthetic agent into the subarachnoid space using a fine needle.

*Cesarean section-* A surgical procedure in which one or more incisions are made through a mother's abdomen (laparotomy) and uterus (hysterotomy) to deliver one or more babies.

*First stage of labor-* Generally divided into a *latent phase* defined as beginning at the point at which the woman perceives regular uterine contractions and an *active phase* starting when the effaced (thinned) cervix is 3- 4 cm dilated and ending in full dilatation at 10cm.

*Second Stage of labor-* Begins when the cervix is fully dilated, and ends when the baby is born.

*Vasopressor*- Drugs that cause vasoconstriction (contract blood vessels) and increase blood pressure, they are used to treat hypotension.

*Epidural blood patch*- An invasive procedure in which autologous blood is injected into the epidural space in order to close one or more holes in the dura mater, usually as a result of a previous lumbar puncture(s).

*Page to arrival*- Time elapsed between sending a text to a doctor via a simple personal telecommunications device for short messages called a *pager* to the time the doctor arrives at the hospital.

*Ambulation*- To walk from place to place or move about.

## 1.0 INTRODUCTION

In 2011 an average of 600 women per month gave birth vaginally at the Kenyatta National Hospital. In the world over more than two thirds of women who give birth vaginally have described the pain of labor with terms such as distressing, overwhelming, horrible, traumatic or excruciating during the first stage of labor and even worse during the second stage despite its short duration.<sup>1</sup> Labor pain is due to stimuli arising from intense uterine contractions and cervical dilatation that is transmitted through visceral sympathetic afferent nerves entering the spinal cord from T10- S1. Perineal stretching also transmits painful stimuli through the somatic pudendal and sacral nerves S2- S4 causing more pain during the second stage of labor.<sup>1</sup>

This pain has prompted trials of pain relief methods, including, hypnosis, water bath, birthing exercises, acupuncture and intravenous/ spinal opioids.<sup>2</sup> Epidural labor analgesia was first used in 1949, became popular in the early 80s and is since then the gold standard.<sup>3</sup> It has become a milestone in obstetric analgesia and has gained widespread use because of its effective pain relief. Due to the availability of safer and more effective new drugs and techniques, the earlier associated complications like, prolonged labor that had raised debates among obstetricians, anesthesiologists, hospital administration and policy makers have decreased significantly.<sup>3</sup>

At the Kenyatta National Hospital, the teaching hospital for University of Nairobi school of resident training, obstetricians gain knowledge on methods of labor pain management such as epidural analgesia by reading obstetrics and gynecology textbooks, attending ward round teachings while rotating in labor ward and through continuous medical education forums. A more practice based approach is used in obstetric postgraduate training in the USA, that involves supervised placement of students in various disciplines within the specialty and while rotating in labor and delivery, they *gain experience* in the principles of obstetrical anesthesia.<sup>4</sup>

Obstetricians generally deal with the pregnant population prenatally, through labor and after delivery. Kenyatta National Hospital being the leading teaching and referral hospital in Kenya, it is host to one hundred and one obstetricians. It is therefore institution of choice for this study.

The objective of this survey is to determine the knowledge, the attitude and the practice of Epidural Labor Analgesia (ELA) among obstetricians at the Kenyatta National Hospital.

## 2.0 LITERATURE REVIEW

Labor pain is a complex and subjective interaction between multiple physical and psychological factors. The parturient deals with not only her pain but myths created for her by culture, forced to endure a long and painful experience that may lead to exhaustion, hysteria and fear rendering her incapable of cooperating with birth attendants.<sup>5</sup> And with cervical stretching, vaginal tearing, ischemia of the uterine wall together with a build-up of lactate, pain worsens in the absence of analgesia. These factors have been implicated in both long and short term disruption of mother to child relationship.<sup>5</sup>

Labor also invokes physiologic responses that may produce deleterious consequences, many of which are amenable to effective and safe pain relief.<sup>6</sup> For instance the increase in plasma catecholamines by over two hundred percent during unmedicated labor that not only causes an increase in cardiac output and blood pressure with a decrease in uterine blood flow.<sup>6</sup> But also a marked stimulation of uterine contractions that centrally autotransfuses and increases cardiac work.<sup>7</sup> The healthy parturient readily tolerates the increase in cardiac work, but high risk parturients with cardiac disease, pulmonary hypertension and severe pre-eclampsia may not tolerate these changes without an adverse outcome.<sup>8</sup>

Similarly, while the healthy fetus easily tolerates the changes in uterine blood flow and oxygen delivery, these changes may be deleterious in the setting of uteroplacental insufficiency.<sup>8</sup> For these high risk mothers and fetuses, effective analgesia may contribute to better outcomes. Labor also markedly increases minute ventilation and oxygen consumption during contractions.<sup>6</sup> Hyperventilation causes severe respiratory alkalosis and a left shift of the maternal oxyhemoglobin dissociation curve, thus diminishing oxygen transfer to the fetus. Compensatory hypoventilation between contractions may cause transient maternal hypoxemia, and potentially fetal hypoxemia.<sup>6</sup>

Pregnancy induced analgesia (PIA) a “*coping mechanism*” is thought to allow laboring women tolerate and survive the intense pain of childbirth<sup>9</sup> and may aid in the understanding of pain modulation at the time of labor and delivery. The proposed mechanism is that the opioid system at the spinal level is activated during pregnancy and can be augmented using intrathecal analgesia during delivery.<sup>9</sup>

## LABOR ANALGESIA

The use of labor analgesia has gained widespread popularity ever since the three famous women, Fanny Longfellow wife of famous American poet Henry Wadsworth Longfellow (1847), Emma Darwin wife of Charles Darwin the eminent naturalist, and Queen Victoria wife of Prince Albert (1853) not only accepted but strongly endorsed the use of analgesia during labor.<sup>10</sup>

The American college of obstetricians and gynecologists and the American society of anesthesiologists have collectively also pointed out that “there is no other circumstance where it is considered acceptable for a person to experience severe pain amenable to safe intervention, while under a physician's care.”<sup>11</sup>

It has also been indicated that “maternal request” is sufficient justification for pain relief during labor.<sup>11</sup> The International Association for the Study of Pain (IASP) declared 2007 to 2008 the global year against pain in women, with the slogan “*real women, real pain.*”<sup>12</sup> They highlighted the importance of treating pain among parturients and the substantial public health impact that could occur if this pain is neglected.

Methods that have been used to relieve pain during labor include but not limited to;  
*Inhalation analgesia*; This is given as entonox a mixture of 50% nitrous oxide and 50% oxygen. Its use is controversial, with doubt as to whether the drug really provides any benefit.<sup>13</sup>

*Spinal opioids*; These cause acceptable labor analgesia without local anesthetic-induced sympathetic and motor blockade. Unfortunately, pain relief is often slow in onset, inconsistent in quality especially during the second stage and associated with a high incidence of pruritus, nausea, urinary retention and sedation.<sup>14</sup> Short-acting lipid-soluble opioids such as fentanyl have been shown to have greater efficacy and produce less side effects compared to water-soluble opioids such as morphine, but in combination they seem to provide rapid-onset and long-acting labor analgesia with a single injection.<sup>15</sup>

*Water bath;* An option that incorporates bath tubs or pools that the parturient gets into, the water helps to support the weight of the uterus, reducing the pressure felt by the mother, also helps to relieve tension in the muscles encouraging deeper relaxation.<sup>16</sup> In uncomplicated deliveries it is thought to reduce the need for analgesia without evidence of increased risk to mother or newborn.

*Hypnosis and mind medicine;* These techniques are also used in conjunction with progressive muscle relaxation and many other forms of relaxation for the mind and body to aid in pain control for women during childbirth. Their risk/benefit profile however demonstrate a need for well-designed trials to confirm efficacy in childbirth .<sup>17</sup>

*TENS- Transcutaneous Electrical Nerve Stimulation;* A transducer generates electrical impulses that are used to reduce pain using four flexible pads attached to the skin of the back, with the control unit being held by the parturient thus in her complete control. There is only limited evidence that transcutaneous electrical nerve stimulation reduces pain in labor and it does not seem to have any impact (either positive or negative) on other outcomes for mothers or babies.<sup>18</sup>

*Lamaze techniques;* ‘birthing classes’ Decreased labor pain may be anticipated in women who have attended childbirth classes and in those who have performed aerobic conditioning exercises during pregnancy. Physically fit mothers are thought to be more comfortable during pregnancy, experience shorter second stage labor, and have healthier babies. In 2002, the American College of Obstetricians and Gynecologists (ACOG) issued new guidelines for exercise in pregnancy. These newer, less restrictive recommendations reflect the conclusions of positive health benefits in pregnancy and labor as has been postulated by researchers over the years.<sup>19</sup>

## *EPIDURAL LABOR ANALGESIA (ELA)*

### ***Classification;***

1. Regular epidural analgesia
2. Combined spinal- epidural analgesia

#### *1. Regular epidural analgesia*

Epidural analgesia involves the injection of a local anesthetic agent and an opioid into the lumbar epidural space. It produces segmental sympathetic and sensory nerve block.<sup>20</sup>

#### *2. Combined spinal–epidural analgesia (CSEA)*

Combined Spinal Epidural Analgesia involves the injection of lower doses of local anesthetic agent and opioid into the lumbar epidural space and the subarachnoid space. This results in rapid analgesia with minimal or no impairment in ambulation, the term “walking” epidural analgesia was therefore coined to describe it.<sup>21</sup> The term is now used for any form of neuraxial analgesia technique that allows safe ambulation. Although ambulation *per se* has not been shown to positively or negatively affect the progress or outcome of labor, dense motor blockade may adversely affect the spontaneous vaginal delivery rate.<sup>21</sup> There is no difference in obstetric outcomes, the incidence of emergency cesarean section or duration of labor and the incidence of instrumental vaginal delivery as compared to regular epidural analgesia as reported in 2001 in a study by Norris et al.<sup>22</sup>

### ***Advantages***

Epidural analgesia provides superior pain relief during the first and second stages of labor therefore a more positive birth experience. It may also allow parturients to rest and relax facilitating patient cooperation during labor and delivery.<sup>6</sup> In the event of complicated labor it provides anesthesia for episiotomy or forceps delivery as well as allowing extension of anesthesia for cesarean delivery. Unlike intravenous medications an epidural avoids opioid-induced maternal and neonatal respiratory depression.<sup>1</sup>

### ***Complications***

Primary complications of epidural analgesia are hypotension that results from peripheral vasodilation occurring during the onset of epidural blockade, and is corrected by intravenous boluses of crystalloid solution and/or small intravenous doses of a vasopressor.<sup>24</sup> Post dural puncture headache relieved by consumption of a caffeinated beverage or an autologous epidural blood patch.<sup>25</sup> and neuraxial analgesia failure.<sup>26</sup> Other rarer ones include shivering, ringing of the ears, backache, fever, nausea, difficulty in urinating and permanent nerve damage.<sup>27</sup>

### ***Contraindications***

The absolute contraindications include patient refusal, maternal hemorrhage, coagulopathy, maternal septicemia or untreated febrile illness, low platelets and infection at the site of lumbar puncture. Relative contraindications include; progressive neurologic diseases, Hypovolemia, raised intracranial pressure<sup>23</sup>

### ***Controversies***

Increased risk of instrumental delivery, prolonged first and second stage of labor, increased caesarean deliveries in uncomplicated pregnancies after epidural analgesia have been debated upon over the years. In 2009 Nafisi concluded that Epidural Analgesia does not prolong the active-first and second stages of labor and does not increase vacuum-assisted or cesarean delivery rate.<sup>28</sup> And in 2011 Spanish obstetricians concluded that the apparent increased duration of labor seems to be attributable to other obstetric factors such as first delivery and not epidural analgesia.<sup>29</sup>

The impact on initiation and duration of breastfeeding has also prompted debates. In 2005 Beilin et al reported that while there was no effect on breastfeeding initiation, there was a reduction in breastfeeding frequency at six weeks.<sup>30</sup> And in 2010 Wilson et al concluded that epidural analgesia did not affect initiation or duration of breastfeeding.<sup>31</sup> In general these authors concluded that epidural analgesia had no adverse effects on the initiation or duration of breastfeeding.

## *THE GENERAL PRACTICE*

The practice of epidural labor analgesia involves both the prenatal period and the time of delivery with each having significant benefits toward effective labor analgesia.

### *The prenatal period*

Epidural labor analgesia ‘begins’ during the prenatal visits where mothers discuss in detail, the women’s expectations regarding the birthing process, their birth plan and the available pain control options with their obstetric care givers. More information on pain control is given in the anesthesia clinics by the anesthesiologist where such clinics are available. A study in Australia in 2007 by Raynes-Greenow determined that, the large discrepancy between perceived and actual knowledge of the likely consequences of labor analgesia is related to womens’ overreliance on anecdotal information.<sup>32</sup> Standardised labor analgesia information may therefore assist health-care providers and women to practice shared decision-making.

Further clarification with respect to the procedure itself, its advantages possible complications and available alternatives is done at the time of delivery to the mothers who request epidural analgesia. This information can be relayed for the first time to mothers who do not know about epidural analgesia at the time of delivery. They are subsequently required to sign an informed consent showing they fully understand and consent to the procedure and acknowledge the potential risks. The obstetrician then calls the anesthesiologist who applies the epidural.

### *At delivery -Induction and maintainance*

Epidural labor analgesia should only be applied when labor is established, the mother has requested and in hospital settings in which the mother's condition can be closely monitored with rapid access to resuscitation equipment and other emergency treatment. The guidelines on obstetric anesthesia by the American college of obstetricians and gynecologists task force indicates, the anesthesiologist conduct a focused history and physical examination before providing anesthesia care<sup>33</sup> consistent with the American Society of Anesthesiologists (ASA) “Practice Advisory for Preanesthesia Evaluation”.

Most obstetricians accept delays of up to thirty minutes in the application of epidural analgesia from the time of request while others think delays bring up difficulties in co-ordinating obstetric and epidural analgesia services. According to the study done by Heath et al in 2010, patients who receive labor epidurals earlier after request are not more satisfied than those who wait longer probably due to the reassurance of the availability of an anesthesiologist.<sup>34</sup>

Approximately 10 ml of 0.125-0.25 % bupivacaine with or without 25ug of fentanyl is given as a test dose, this establishes effective analgesia with minimal motor block. If there are no adverse reactions after thirty minutes, another 10-20ml is added. Thereafter, maintenance of epidural analgesia may be achieved by intermittent bolus injections of 10ml/ hr, continuous epidural infusion of (1-6ml/hr of the same concentration) or patient-controlled epidural analgesia (PCEA) set to a maximum of 6mls/hr.<sup>35</sup>The dose of local anesthetic necessary to achieve effective labor analgesia depends on the intensity and location of the patient's pain. As labor progresses the anesthesiologist must ensure that the segmental extent of epidural analgesia has spread to include the S2-4 nerve roots to maintain analgesia during this stage of labor. Women who have been receiving continuous epidural analgesia for many hours often have superior pain relief.

## STUDIES OF KNOWLEDGE ATTITUDE AND PRACTICE OF EPIDURAL ANALGESIA AMONG OBSTETRICIANS

Studies done in other parts of the world between 1998 to 2010 to ascertain the knowledge, attitude and practice of epidural labor analgesia among obstetric practitioners showed related results. Response rates varied from 68% in Australia<sup>36</sup> to 94.7% in Turkey<sup>37</sup>. Many obstetricians seemed to have only received lectures post speciality training, about half rating the lectures inadequate in Nigeria and 20% to 35% achieved inadequate knowledge scores in Australia and Turkey respectively. While the Australian study showed significantly better knowledge scores among those with < 5 years experience, the Turkish study showed better scores among those with 6-15 years experience. These studies favored a collaborative effort between anesthesiologists and obstetricians both during and after specialty training to improve knowledge with regard to use, complications and effect of epidural analgesia on labor.<sup>38</sup>

Younger female obstetricians significantly favored epidural analgesia in comparison to their older male counterparts above 40 years in the Canadian study.<sup>39</sup> While up to 37.8%- 77% obstetricians thought Epidural Analgesia prolonged labour and increased incidence of instrumentation, over 84.4% agreed the technique was not associated with adverse neonatal or maternal outcome and up to 97.8% would prefer epidural analgesia. A delay of 20-30 minutes was acceptable for 81-84% obstetricians. Overall prevalence showed by the German study was < 10%, they too saw a need for further improvements.<sup>40</sup>

### **3.0 STUDY JUSTIFICATION**

The increased availability of epidural analgesia and the favorable experiences of women who have had painless labor with epidural analgesia have reshaped the expectations of pregnant women entering labor. It is therefore important that obstetricians are fully aware of epidural labor analgesia.

Normal child birth is associated with physical and psychological trauma with great impact on maternal and infant morbidity and mortality and is associated with excruciating pain amenable to safe analgesia (epidural labor analgesia) that is known and accepted worldwide. The knowledge, attitude and practice of epidural analgesia by obstetricians at the Kenyatta National Hospital is however unknown since no study has been done to determine this.

And whereas epidural labor analgesia may not yet be readily available at the Kenyatta National Hospital, it is bound to be sooner rather than later. It is therefore important to study the knowledge, attitude and practice of obstetricians concerning epidural labor analgesia to know the reason for its low uptake and make necessary recommendations to enable a smooth introduction of an effective epidural labor analgesia program so that mothers at the Kenyatta National Hospital can have access to safe analgesia during labor if they so desire.

## **4.0 STUDY OBJECTIVES**

### **4.1 Broad objective**

The main objective of this survey was to determine the knowledge, attitude and practice of obstetricians at the Kenyatta National Hospital regarding epidural labor analgesia.

### **4.2 Specific objectives**

1. To determine the knowledge on different aspects of epidural labor analgesia among the obstetricians at the Kenyatta National Hospital
2. To determine the attitude of obstetricians at the Kenyatta National Hospital towards the routine use of epidural labor analgesia and relate this to factors that influence opinion such as years of practice, age and gender.
3. To determine the percentage of obstetricians who often practiced epidural labor analgesia at the Kenyatta National Hospital.
4. To determine in the opinion of the obstetricians, what is biggest hindrance to an epidural labor analgesia program at the Kenyatta National Hospital.

## **5.0 METHODOLOGY**

### *5.1 Study design*

This study was designed as Cross-sectional descriptive survey using a likert type questionnaire accompanied by a cover letter and a consent form.

### *5.2 Study site*

The survey was carried out at obstetrics and gynecology department of the University of Nairobi and the Kenyatta National Hospital labor ward.

### *5.3 Study method*

The survey was done after the approval of Kenyatta National Hospital /University Of Nairobi Ethics and Research committee. Data collection tool was pre tested at the obstetrics and gynecology department of university of Nairobi after survey had been explained to participants. It was said to be well understood, simple and took approximately 10-15 minutes to fill. Participants were excited about the topic and encouraged it.

For the actual survey, the study was explained to the participant by the principal researcher (this took about 30 minutes) before handing the pre tested questionnaires to those that consented to the study. They were filled out and returned at the same sitting. The filled out questionnaires were then checked for completeness. To facilitate proper data collection and avoid participants discussing questions, continuous medical education (CME) days (Fridays) were capitalized on. The survey ran from 15<sup>th</sup> April to 30<sup>th</sup> May 2013.

During data analysis, knowledge questions with the answers “agree” and “strongly agree” were termed as TRUE, those with “disagree” and “strongly disagree” termed FALSE and neutral termed DON’T KNOW. The data was then coded into a computer, analyzed using SPSS software version 20.0 and presented using tables, graphs and charts.

#### 5.4 Study population

The study population consisted of both registrar and consultant obstetricians at the Kenyatta National Hospital.

#### SAMPLE SIZE CALCULATION:

To calculate the sample size, the study used the Cochran Formula used by Fisher et al <sup>41</sup>

*Formula;*

$$n = \frac{z^2 pq}{d^2}$$

*Where;*

*N* is sample size

*Z* is the standard normal deviation at the required confidence level (95%), in this case 1.96

*P* is the proportion in the target population estimated to have characteristics being measured.

Since there is no estimate available of the proportion in the target population assumed to have the characteristics of interest, 50% (0.5) was used as recommended in the same formula.<sup>41</sup>

*q* Is 1-p=0.5

*D* is the statistical significance = 0.05

*Therefore;*

$$n = \frac{(1.96)^2 \times (0.5) \times (0.5)}{(0.05)^2}$$
$$= 384$$

The study population being < 10000 the sample size is;

$$nf = \frac{n}{1+n/N}$$

*Where;*

*nf* = the desired sample size (when the population is < 10,000).

*n* = the desired sample size {when the population is > 10,000 (384)}

*N* = the estimated population of obstetricians at the KNH ; 23 Consultants , 23 second year registrars and 25 third year registrars. Total= 71

Therefore;

$$nf = \frac{384}{1 + (384/71)}$$

The desired sample size was =**60**

### 5.5 Inclusion/ exclusion criteria

#### Inclusion criteria

Second year and third year registrar obstetricians at the Kenyatta National Hospital who consented to the study.

Consultant obstetricians at the Kenyatta National Hospital who consented to the study.

#### Exclusion criteria

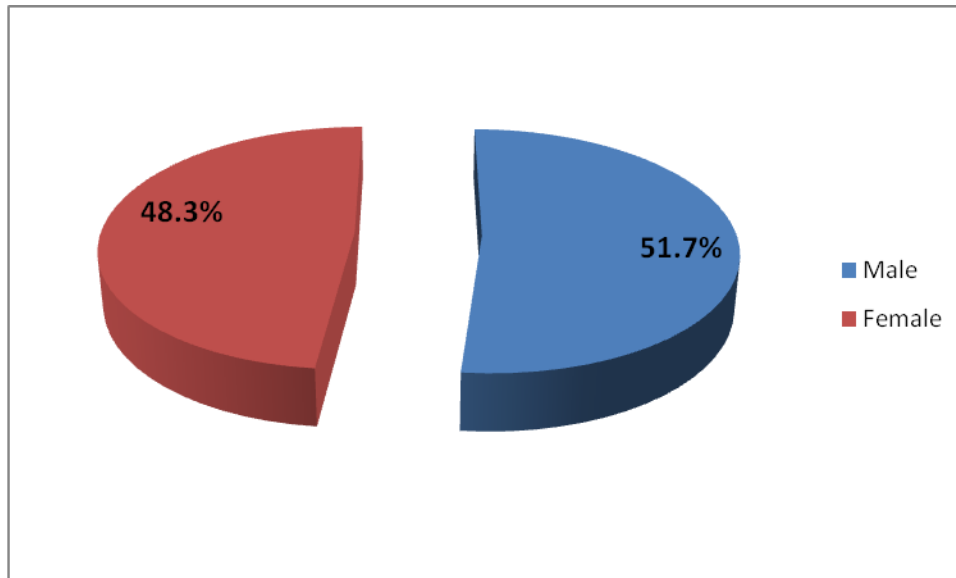
1. Obstetricians at the Kenyatta National Hospital who did not consent to the study.
2. Obstetricians at the Kenyatta National Hospital who were on leave and out of the hospital or/and university of Nairobi obstetrics and gynecology department throughout the period of the study.
3. Obstetrics registrars in their first year of study- Having just joined the program most students would not have rotated through labor ward to have had adequate exposure at the time of the survey.

## **5.6 *Ethical considerations***

1. The nature of the study was explained to the participants.
2. The study had no harmful effects on the participants.
3. No obstetrician was singled out for refusal to participate
4. There were no cost implications on the participants
  
5. Only initials were used and each participant remained anonymous and their opinion handled in absolute confidentiality
  
6. Permission was sought from Kenyatta National Hospital/ University of Nairobi Ethics and Research Committee.
  
7. Study findings were availed to the Ethics and Research Committee of Kenyatta National Hospital/University of Nairobi, and departments of obstetrics and gynecology and anesthesia for their appropriate action.
  
8. At the end of the study data was preserved in an encrypted file in soft copy and hard copies safely locked up in a locker for future reference.

## RESULTS

### GENDER DISTRIBUTION OF PARTICIPANTS

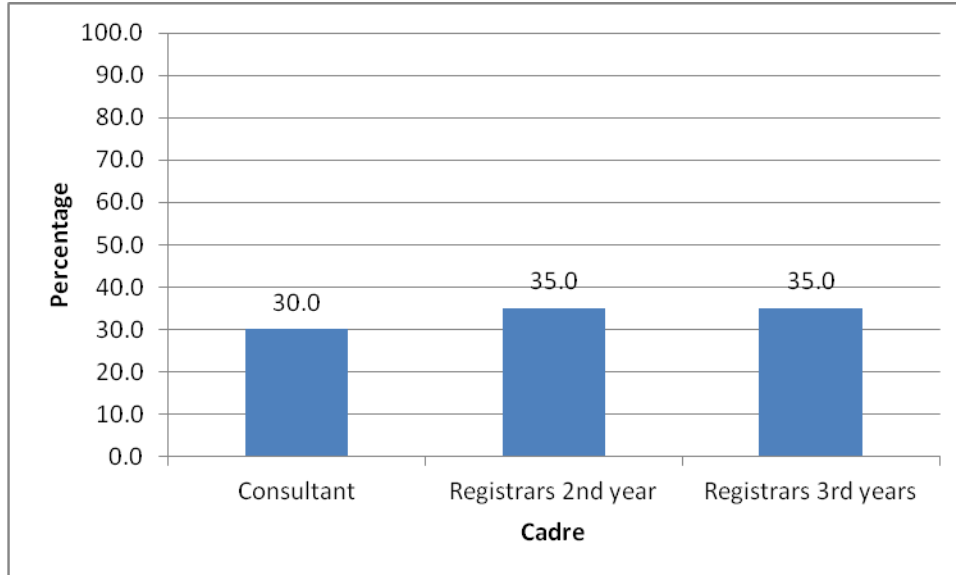


**Fig 1**

Male participants were thirty one 31(51.7%) and female participants were twenty nine 29 (48.3%). Fig.1

This represents a male to female ratio of approximately 1.3:1.

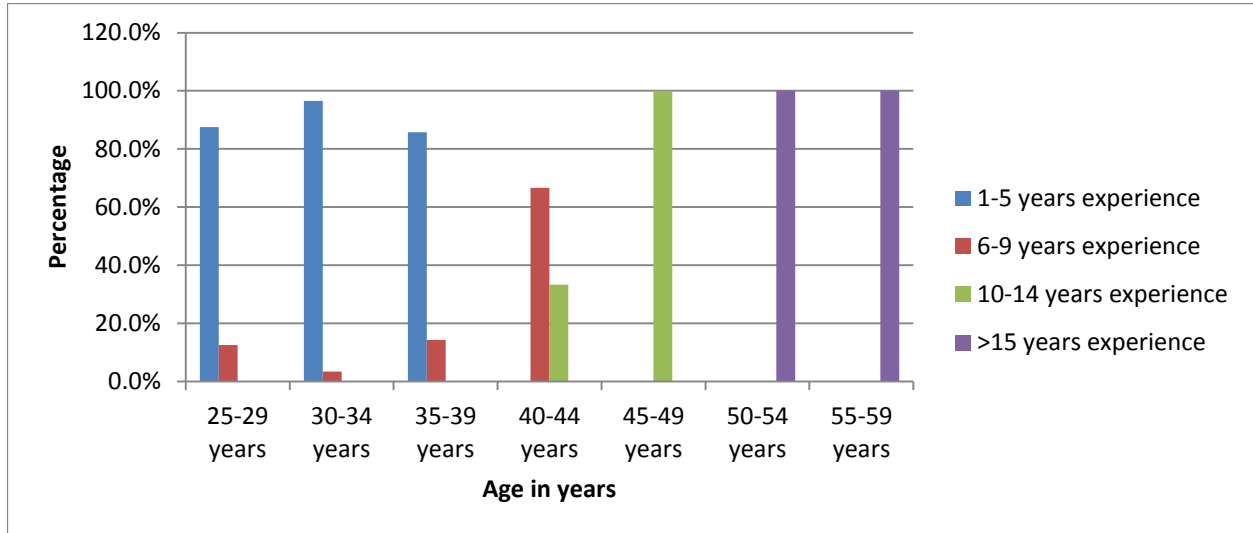
## **CADER OF RESPONDENTS**



**Fig 2**

Of the two cadres of obstetricians surveyed, Consultants were (18) 30%, second year registrars were (21) 35% and third year registrars also (21) 35%. (Fig. 2)

## YEARS OF EXPERIENCE OF AND AGE OF PARTICIPANTS



**Fig 3**

Seventy one point seven (71.7%) had practiced for between 1-5 years their ages ranged between 25-35 years, 8.3% and 11.7% had practiced for more than 15 years and their ages ranged between 50-59 years. Years of experience generally matched age. Fig 3

**RESPONSES ON KNOWLEDGE AMONG PARTICIPANTS** (table 1)

	<b>TRUE</b>	<b>DON'T KNOW</b>	<b>FALSE</b>
Epidural analgesia has no effect on duration of labor	30%	3.3%	66.7%
Fever commonly occurs following Epidural Analgesia	30%	20.0%	60%
Epidural Analgesia is best applied at stage 2 of labor?	30%	6.7%	73.3%
Nulliparous women benefit more from Epidural Analgesia compared to multiparous women	36.7%	23.3%	50%
Epidural analgesia increases the incidence of caesarian sections	23.4%	8.3%	78.4%
High risk patients should have Epidural Analgesia applied in the late first stage of labor	36.7%	10.0%	53.3%

**1.KNOWLEDGE**

Only 30% of the participants understood that epidural analgesia had no effect on duration of labor but 78.4% of the participants correctly stated that epidural analgesia does not increase the incidence of caesarean sections. Also, 60% correctly indicated that fever does not commonly occur following the application of epidural analgesia. Most participants correctly stated that epidural labor analgesia is not best applied at stage two of labor and in the late first stage of labor for the high risk patients. And half of the participants knew that nulliparous women do not benefit more from epidural analgesia compared to their multiparous counterparts.

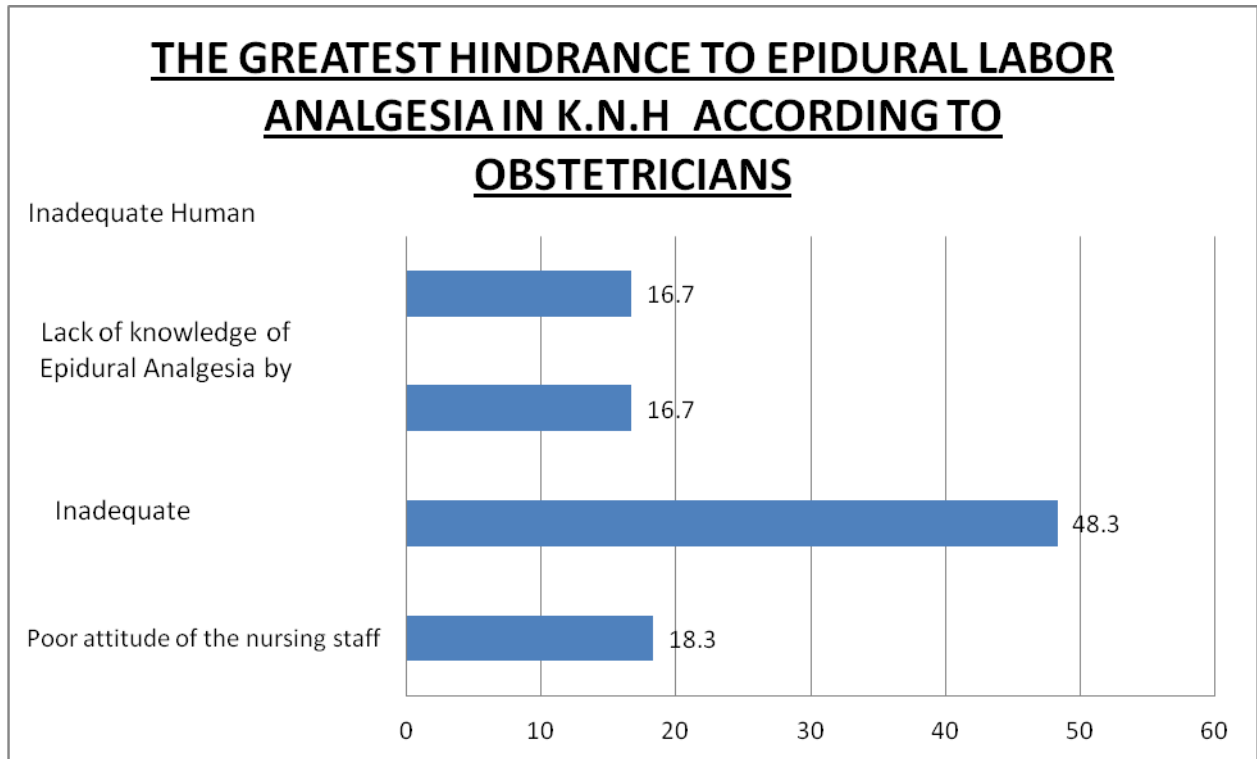
NB: All consultants had trained at the University of Nairobi (UON) except one and this consultant did not have better knowledge scores as compared to the other consultants from UON.

ATTITUDINAL SCORES AMONG PARTICIPANTS (table 2)

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
Kenyatta national hospital has adequate professionals (obstetricians, anesthesiologists and nurses) to handle an Epidural Analgesia program	30.0%	23.3%	3.4%	30.0%	13.3%
Kenyatta national hospital has adequate equipment to handle Epidural Analgesia and its possible complications	28.3%	13.3%	3.4%	25%	30.0%
Epidural analgesia denies mothers the participation in their birth experience.	10.0%	13.3%	5.0%	41.7%	30.0%
The anesthesia department in K.N.H has not been supportive when asked to apply Epidural Analgesia for labor	21.7%	15.0%	26.7%	25.0%	11.7%
Less than 30% of the mothers who come to Kenyatta National Hospital are college educated	10.0%	43.3%	11.7%	25.0%	10.0%
The method of education on Epidural Analgesia for registrars at the University Of Nairobi is inadequate	46.7%	23.3%	10.0%	8.3%	11.7%
Epidural Analgesia should be routinely offered to parturients at the Kenyatta National Hospital	46.7%	35.0%	3.3%	10.0%	5.0%

## 2. ATTITUDE

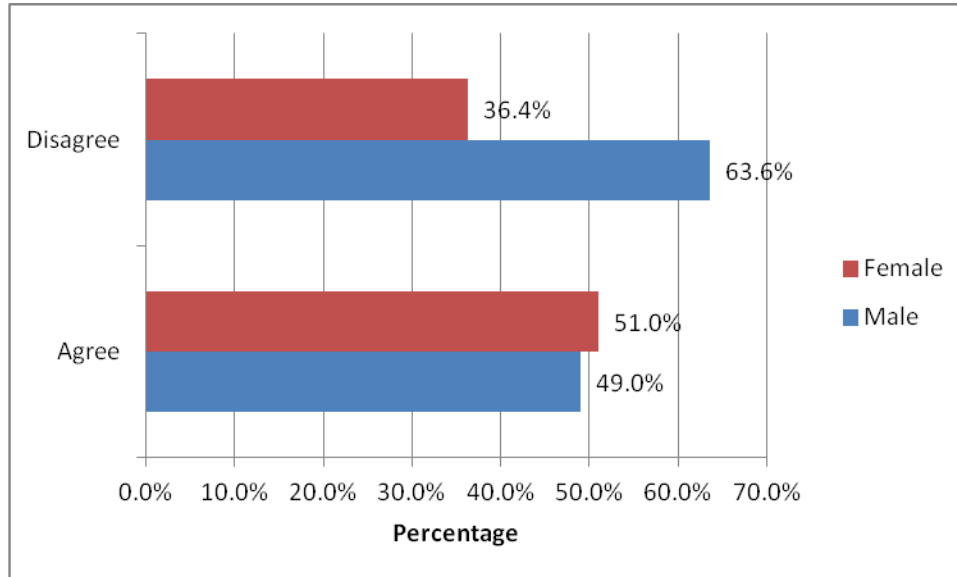
While 53.3% thought that Kenyatta National Hospital (K N H) has an adequate number of professionals to handle an epidural analgesia program, 55% thought KNH does not have adequate equipment to handle epidural analgesia and its possible complications. Also, more than half thought that < 30% of the mothers who come to Kenyatta National Hospital are college educated. Seventy percent thought that the method of education on epidural labor analgesia at the University of Nairobi was inadequate. Majority of the participants thought epidural labor analgesia (ELA) does not deny mothers the participation in their birth experience and favored routine counseling of parturients on it. Participants seemed divided as to whether or not the anesthesia department had been supportive on the subject.



**Fig 4**

48.3% of the participants indicated that inadequate equipment was the greatest hindrance to epidural labor analgesia program at the K.N.H. The other reasons were; poor attitude of the nursing staff, lack of knowledge by obstetricians and inadequate human resource. (Fig 4)

PARTICIPANTS WHO THINK EPIDURAL LABOR ANALGESIA SHOULD BE OFFERED ROUTINELY VS GENDER



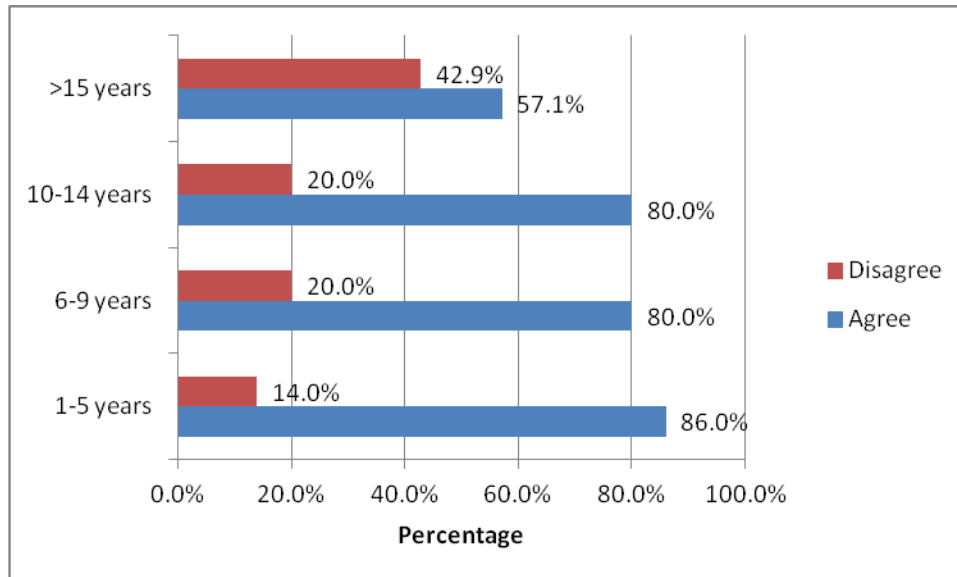
**Fig 5a**

Fifty one percent (51.0%) of those that support the routine use of epidural labor analgesia were female, 63% of those that disagreed were male.

There was no statistical significance between gender and positive attitude towards the routine use of epidural analgesia in labor

p value 0.107 (Fig 5a)

PARTICIPANTS WHO THINK EPIDURAL LABOR ANALGESIA SHOULD BE OFFERED ROUTINELY AGAINST YEARS OF PRACTICE



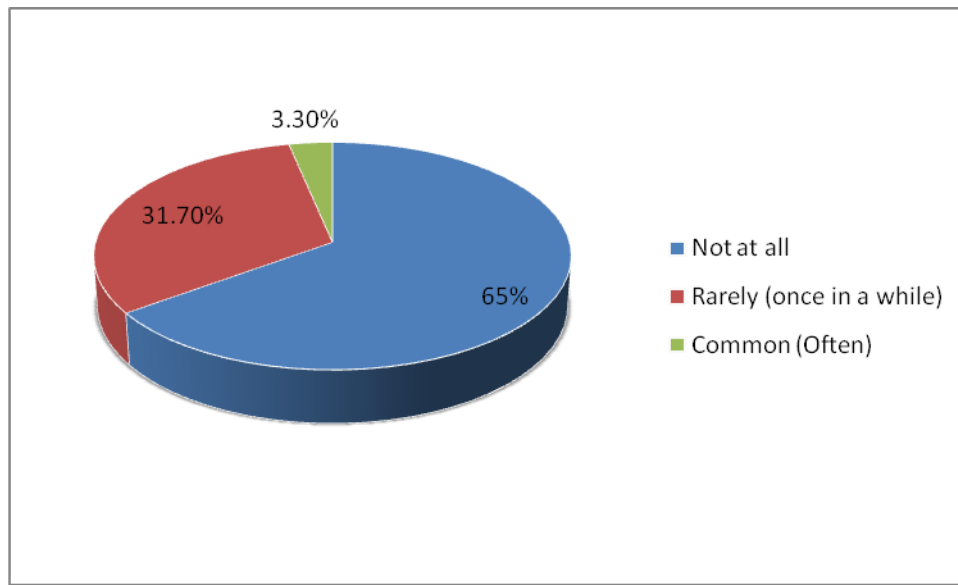
**Fig 5b**

Eighty six percent (86%) of participants who had practiced for 1-5 years and also the youngest favored the routine use of epidural labor analgesia. Tendancy toward epidural analgesia seems to reduce with increase in age and years of experience.

There was however no statistical significance between difference in years of experience and and tendancy toward epidural labor analgesia. P value 0.097 (Fig 5b)

## PRACTICE

### HOW OFTEN OBSTETRICIANS PRACTICED EPIDURAL LABOR ANALGESIA AT THE KENYATTA NATIONAL HOSPITAL

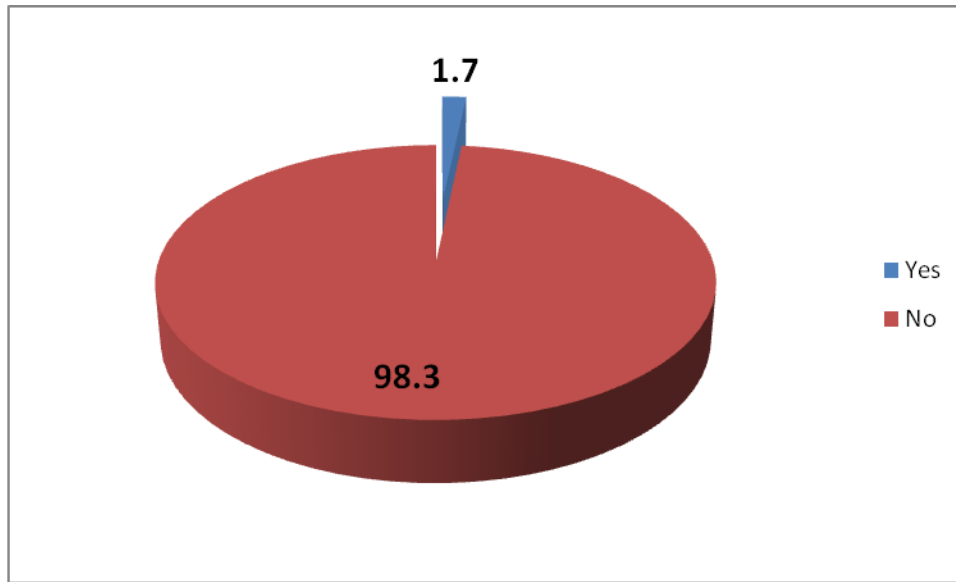


**Fig 6**

Only 3.3% participants often practiced epidural labor analgesia, 65% did not practice at all and 31.7% practiced every once in a while.

p- value 0.087 (Fig 6)

## THE USE OF EPIDURAL ANALGESIA ON PARTICIPANTS AND THEIR SPOUSES



**Fig 7**

An overwhelming 98.3% of the participants said they themselves had never used epidural analgesia on themselves or had it done for their spouses. Only 1.3% said they had personally used epidural in labor for his spouse because he had read about it and decided to try it. (Fig 7)

Out of the 98.3%, 42.9% said they had not themselves used it because they had no children, 17.9% said they did not know much about epidurals when they had their babies. The remaining 38.9% had other reasons varying from 5.5% having had precipitate labor to 17.9% saying they were not given that option and 7.1% said it was not available where they asked for it and 8.4% had chosen elective caesarean sections. None of the participants said they did not support the use of epidural analgesia in labor.

## **DISCUSSION**

While pain relief in child birth has for decades been considered unwarranted especially in African cultures, epidural labor analgesia has now become popular and acceptable as a form of labor analgesia worldwide.<sup>8</sup> It is the most complete and effective method of pain relief during childbirth, and the only method that provides analgesia without maternal or fetal sedation.<sup>5</sup> Its use is instigated by the attending obstetrician during antenatal clinic or sometimes at the time of labor and delivery. The obstetrician who does not him/herself apply the epidural is the initiator of the whole process as he/she recommends it to mothers and calls the anesthesiologist who applies it to the interested mothers. It was thus important to choose obstetricians as the target study population for this survey.

The main aim of the survey was to determine the knowledge, attitude and practice of obstetricians at the Kenyatta National Hospital with regard to epidural labor analgesia with a view of finding out in the opinion of the obstetricians why there was such a low uptake of epidural labor analgesia in this institution despite its effectiveness and the growing trends worldwide. The study also sought to find out deficits in knowledge, attitude and practice if any with the aim improving the same therefore fostering a working effective epidural labor analgesia program at the Kenyatta National Hospital.

Kenyatta National Hospital was chosen as the study site because it is the primary training institution for obstetricians in Kenya.

The survey was characterized by a 100% response rate. This in a way showed the obstetricians' interest in the topic.

The survey incorporated both registrar and consultant obstetricians because both are actively involved in the management of pregnant women from booking to counseling up until delivery therefore have equal opportunity to practice epidural labor analgesia. Also as seen in other studies knowledge does not always have a linear relationship with years of experience.<sup>36</sup>

Majority of the participants (71.7%) had 1-5 years of experience, they were also the youngest with ages of between 25-36 years and most were female. Only seven, most of which were male obstetricians had practiced for more than 15 years. This is comparable to the Canadian study done in 2011.<sup>39</sup> This may lead to better trends in the use of epidural labor analgesia since younger female obstetricians seem to favor Epidural Analgesia slightly more compared to the older obstetricians.

## 1.KNOWLEDGE

Majority (66.7%) of participants *did not know* that epidural analgesia does not affect the duration of labor. A study by Nafisi in 2006 showed that Epidural Analgesia does not prolong the active-first or second stage of labor.<sup>28</sup> A similar study done in 2011 by Spanish obstetricians concluded that the apparent increased duration of labor seems to be attributable to other obstetric factors such as first delivery rather than epidural analgesia.<sup>29</sup> This issue has however remained controversial among many obstetricians.<sup>1</sup>

Sixty percent (60%) participants *knew* that fever does not frequently occur following application of epidural analgesia. This is usually a mild fever of < 38° C and occurs in the absence of any infectious process. It is one of the rarer complications documented. This is confirmed in a study done in 2005 by Fernandez.<sup>42</sup> Though rare, the knowledge that epidural analgesia may provoke fever may help to avoid unnecessary use of antibiotics or fetal extraction.

Most participants (73.3%) *knew* that epidural analgesia is not best applied at stage two of labor. Randomized controlled trials have uniformly demonstrated that early labor neuraxial may result in faster labor and does not adversely affect the progress and outcome of labor.<sup>6</sup>

Half the participants (50%) *knew* that nulliparous women do not benefit more from epidural analgesia compared to multiparous women. Studies have shown that the mean intensity of pain increases equally with increased cervical dilatation in nulliparous women as with their multiparous counterparts.<sup>43</sup> It can be therefore concluded that neither the nulliparous nor the multiparous need analgesia more.

Majority (78.4%) *knew* that epidural analgesia does not increase the incidence of caesarian deliveries this is in tandem with a study done in 2004 in Dallas by Sharma et al.<sup>46</sup>

More than half (53.3%) of the participants *knew* epidural analgesia should not be applied in the late first stage of labor for high risk mothers. A study done by Doshi in 2009 showed positive results with epidural analgesia applied during early first stage of labor with cervical dilatation of  $> \text{ or } = 3\text{cm}$ .<sup>8</sup> As labor progresses sympathetic nervous system response to pain results in marked increase in circulating catecholamines e.g norepinephrine and epinephrine that cause increased cardiac work, oxygen demand etc, such are difficult for high risk mothers to sustain. Effective analgesia attenuates this.<sup>9</sup> It is therefore important to give adequate analgesia early.

## 2. ATTITUDE

In the opinion of 53.3% (32) participants, Kenyatta national hospital has adequate professionals (obstetricians, anesthesiologists and nurses) to handle an epidural analgesia program, this is relevant because as studies show, epidural rates are by and large affected by the availability of anesthesia providers, nurses and practice policies in hospitals.<sup>43</sup>

Kenyatta National Hospital does not have adequate equipment to handle epidural analgesia and its possible complications in the opinion of 55% (33). This affects practice as is highlighted by International association for the study of pain (IASP) as the statistic in many low to middle income countries.<sup>43</sup>

While 71.7% participants thought epidural analgesia does not deny mothers the participation in their birth experience, Canadian obstetricians were less positive about the role of mothers in their own birth.<sup>39</sup> This could be attributed to the differences in culture.

Participants seemed divided on whether or not the anesthesia department at the Kenyatta National Hospital had been supportive when asked to apply epidural analgesia for labor, while this is inconsequential, better working relations need to be fostered between the anesthesia and obstetric and gynecology departments for better service delivery. Other studies have also emphasized collaborative effort between obstetricians and anesthesiologists as a source of good epidural labor analgesia services.<sup>37</sup>

Most participants (53.3%) thought that less than 30% of the mothers who come to Kenyatta National Hospital seeking maternal health services were college educated. This may contribute to reduced counseling since lower education levels are generally associated with low acceptance levels. A study done by Sheiner et al in 2000 seemed to support this concept.<sup>44</sup>

According to 70% participants, the method of education on epidural analgesia for obstetric registrars at the University of Nairobi was inadequate. Such was the case in the Nigerian study where half of the obstetricians rated their lectures inadequate.<sup>37</sup> This could in a way be attributed to inadequate collaboration between the obstetrics and anesthesia departments and very low or no emphasis on the practical aspect of epidural analgesia in the obstetric postgraduate curriculum at the University of Nairobi.

Most participants (81.7%) favored the routine use epidural labor analgesia at the Kenyatta National Hospital. Most of these were younger female obstetricians. This is comparable to the Nigerian and the Canadian studies<sup>37 38</sup>

In the opinion of obstetricians the greatest hindrance to an epidural labor analgesia program at the Kenyatta National Hospital was inadequate equipment. Studies show that the main reason ascribed by patients not being able to obtain epidural in labor despite asking for it were related to limited equipment and resources.<sup>45</sup>

### 3.PRACTICE

Despite their good knowledge and a positive attitude towards epidural labor analgesia, only 3.3% participants often practiced epidural labor analgesia at the Kenyatta National Hospital. This could be attributed to the fact that in the opinion of most participants, K.N.H has inadequate equipment. These low trends are comparable to the German study where epidural rates were less than 10%.<sup>40</sup> Improvements in use of Epidural analgesia in labor seem necessary to match the rising trends worldwide.

There was no relation between personal experience and practice of epidural labor analgesia, one could however argue that most of the young (< 35 years) participants who had a tendency toward epidural labor analgesia had no children.

## **8.0 CONCLUSIONS**

1. Knowledge makers of the application of epidural labor analgesia ranged from 50-78% in relation to timing, complications and incidence of caesarean sections.
2. Most obstetricians (81.7%) at the Kenyatta National Hospital had a positive attitude towards the routine use of epidural labor analgesia among parturients at the K.N.H. There was no statistical significance between tendency toward epidural labor analgesia and age, gender or years of practice.
3. Only 3.3 % obstetricians at Kenyatta National Hospital often practiced epidural labor analgesia.
4. The greatest hindrance to an epidural analgesia program at the Kenyatta National Hospital in the opinion of obstetricians was inadequate equipment.

## **9.0 RECOMMENDATIONS**

1. The obstetrics department of the University of Nairobi to foster collaboration between themselves and the anesthesia department to further improve knowledge on epidural labor analgesia.
2. The anesthesia department to include labor ward in their duty rota to show goodwill and increase awareness among the obstetric care givers so as to build firm support toward routine epidural labor analgesia for parturients at the Kenyatta National Hospital.
3. Kenyatta National Hospital and the departments of obstetrics and anesthesia to come up with protocols that will design and aid the implementation of favorable epidural labor analgesia practices.
4. Kenyatta National Hospital to increase resource allocation to maternal health services for procurement of equipment so as to aid in the establishment of an effective epidural labor analgesia program.

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## APPENDIX 1

### CLIENT EXPLANATION FORM

Dr. Christine Apondi

H58/64357/10

Tel: 0720581151

Dear colleague,

I am a Registrar currently undertaking a Master of Medicine (M.Med) degree in anesthesia at the University of Nairobi. As part fulfillment of the M.Med program requirements, I am conducting a study titled '**A SURVEY OF KNOWLEDGE ATTITUDE AND PRACTICE OF OBSTETRICIANS REGARDING EPIDURAL LABOR ANALGESIA AT THE KENYATTA NATIONAL HOSPITAL**'.

My study population includes second and third year registrars in obstetrics and gynecology and consultant obstetricians at the Kenyatta National Hospital. The survey will be carried out over a period of six weeks. I intend to determine the knowledge on Epidural Analgesia (EA) among the obstetricians, what the practice of Epidural Labor Analgesia, and to determine attitudinal differences among participants. All in all determine what obstetricians think is the reason Epidural Labor Analgesia is not routinely offered at the KNH and why.

I am requesting about five minutes of your time to fill out the attached consent form and questionnaire. Please answer all the questions as directed. Confidentiality will be maintained. Feel free to ask for any clarification on matters pertaining to this survey at anytime.

This is not a fault finding exercise, rather the study findings will be presented to the KNH/UON ethics and research committee, departments of anesthesia and obstetrics and gynaecology and used to make recommendations on Epidural Labor Analgesia.

This is a voluntary exercise and you can withdraw from the survey at any time. No monetary payment will be given or asked for participating in this survey.

Thank you, Dr. Christine Apondi.

**APPENDIX 2**

**CONSENT FORM.**

I \_\_\_\_\_ [initials], hereby consent to be included in the survey titled **‘A SURVEY OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING EPIDURAL LABOR ANALGESIA AMONG OBSTETRICIANS AT THE KENYATTA NATIONAL HOSPITAL.’**

I confirm that I have read the cover letter that outlines the nature of the survey and understand that confidentiality will be maintained. In case any problems or questions arise during the study period I can contact the primary researcher Christine Apondi on 0720581151 or chrisonke@gmail.com for necessary clarifications and further information.

I fully understand the right of withdrawal from the study at anytime.

I hereby give my consent.

Name: \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Statement by the researcher:

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participants have been answered. I confirm the individual has not been coerced to participate in the study and the consent has been given freely and voluntarily.

Name: \_\_\_\_\_

Signature of the researcher: \_\_\_\_\_

Date : \_\_\_\_\_

**APPENDIX 3**

**QUESTIONNAIRE**

Tick the appropriate answer;

1. Biodata; Initials.....

Sex; M F

2. Cadre;

a) Consultant

b) Registrars

i) Second year

ii) Third year

3. Age .....

4 .Length of obstetric career (during and after post graduate studies);

1) 1-5 yrs

2) 6-9 yrs

3) 10-14 yrs

4) 15-20 yrs

5) > 20 yrs

5. School of post graduate studies in obstetrics and gynecology (consultants only)

.....

<u>1.knowledge;</u>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
<b>1.1</b> Fever commonly occurs following Epidural Analgesia	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.2</b> Epidural Analgesia is best applied at stage 2 of labor?	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.3.</b> Nulliparous women benefit more from Epidural Analgesia compared to the multiparous women	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.4</b> Epidural analgesia has no effect on duration of labor	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.5</b> Epidural analgesia increases the incidence of caeserian sections	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.6</b> High risk patients should have Epidural Analgesia applied in the late first stage of labor	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

<u>2. Attitude</u>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
<b>2.1.</b> Kenyatta national hospital has adequate professionals( obstetricians, anaesthesiologists and nurses) to handle an Epidural Analgesia programme	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>2.2</b> Kenyatta national hospital has adequate equipment to handle Epidural Analgesia and its possible complications	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>2.3</b> Epidural analgesia denies mothers the participation in their birth experience.	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>2.4</b> The anaesthesia department in KNH has not been supportive when asked to apply Epidural Analgesia for labor	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>2.5</b> Less than 30% of the mothers who come to Kenyatta National Hospital are college educated	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

2.6. The method of education on Epidural Analgesia for registrars at the University Of Nairobi is inadequate	1	2	3	4	5
2.7 Epidural Analgesia should be routinely be offered to patients at the Kenyatta National Hospital	1	2	3	4	5

**2.8** Have you or ( if male) your spouse had an epidural done in labor?

- i) Yes                      ii) No

If yes why;

- a) I have had good experiences with Epidural Analgesia in my patients so I used it
- b) My friends encouraged me after their pleasant experiences
- c) I had read about it and I wanted to try it
- d) Other specify

If no why;

- a) I have no children
- b) I didn't know much about Epidural Analgesia when I had my baby (ies)
- c) I don't support the use of Epidural Analgesia
- d) Other specify

**2.9** In your opinion what is the greatest hindrance to an effective Epidural Labor Analgesia program at the Kenyatta National Hospital.

- a) Poor attitude of the nursing staff
- b) Poor attitude of the mothers
- c) Inadequate resources
- d) Lack of knowledge on epidural Analgesia by obstetricians
- e) Other specify

**3.1** Do you routinely educate mothers on epidural analgesia in prenatal clinics at the Kenyatta National Hospital?

- 1. Yes
- 2. No

**3.2** How often do you practice Epidural Labor Analgesia at the Kenyatta National Hospital on a scale of 1-5?

- 1-Not at all
- 2- Rarely (once in a while)
- 3- Common (often)
- 4- Frequent (more than twice a week)
- 5- Always (every time)

**APPENDIX 4****BUDGET**

ITEM	UNIT COST KSh	NUMBER OF UNITS	TOTAL COST KSh
Printing	5000	2	10,000
Paper	400	4	1,600
Internet hours	120	10	1,200
Statistician	20,000	1	20,000
Document binding	200	4	800
ERC fee	1000	1	1000
Sub total			34,600
Contingency @ 5% of sub total			1730
Grand Total			36,330

**APPENDIX 5****WORK PLAN.**

<b>ACTIVITY</b>	2012 Sept	2012 Oct	2012 Nov	2012 Dec	2012 Jan	2012 Feb	2012 Mar	2012 Apr	2013 May	2013 Jun
Proposal Writing	√	√	√							
Presentation to Ethical Review Committee				√	√	√				
Pilot Study							√			
Data Collection								√	√	
Data Processing									√	
Report Writing									√	
Study Presentation										√



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 Telegrams: MEDSUP, Nairobi  
 15<sup>th</sup> April 2013

Dr. Christine Apondi  
 Dept. of Surgery  
 School of Medicine  
 University of Nairobi

Dear Dr. Apondi

**Research proposal: A survey of the Knowledge, Attitude and Practice regarding Epidural labor analgesia among obstetricians at the Kenyatta N.Hospital (P675/12/2012)**

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above revised proposal. The approval periods are 15<sup>th</sup> April 2013 to 14<sup>th</sup> April 2014.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study  
 This information will form part of the data base that will be consulted in future when processing related



Yours sincerely

**PROF. M. L. CHINDIA**  
**SECRETARY, KNH/UON-ERC**

- c.c. Prof. A.N. Guantai, Chairperson, KNH/UoN-ERC
- The Deputy Director CS, KNH
- The Principal, College of Health Sciences, UoN
- The Dean, School of Medicine, UoN
- The Chairman, Dept. of Surgery, UoN
- The HOD, Records, KNH
- Supervisor: Dr. Mark Gacii, Dept. of Surgery, UoN



**UNIVERSITY OF NAIROBI**  
**Declaration of Originality Form**

Name of Student \_\_\_\_\_

Registration Number \_\_\_\_\_

College \_\_\_\_\_

Faculty/School/Institute \_\_\_\_\_

Department \_\_\_\_\_

Course Name \_\_\_\_\_

Title of work \_\_\_\_\_

\_\_\_\_\_

**DECLARATION**

1. I understand what Plagiarism is and I am aware of the University's policy in this regard
2. I declare that this \_\_\_\_\_ (Thesis, project, essay, assignment, paper, report, etc) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi's requirements.
3. I have not sought or used the services of any professional agencies to produce this work.
4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own work.
5. I understand that any false claim in respect of this work shall result in disciplinary action, in accordance with University Plagiarism Policy.

**Signature of student** \_\_\_\_\_

**Date** \_\_\_\_\_

**Signature of supervisor(s)** \_\_\_\_\_

**Date** \_\_\_\_\_