

**COMPARISON OF 0.125% ROPIVACAINE – DEXMEDETOMIDINE  
VERSUS 0.125% LEVOBUPIVACAINE – DEXMEDETOMIDINE FOR  
EPIDURAL LABOUR ANALGESIA**

*Dissertation Submitted to*

**THE TAMILNADU Dr. M.G.R.MEDICAL UNIVERSITY**

**CHENNAI**

*In Partial fulfilment of the University*

*regulations for the award of*

**MD DEGREE IN ANAESTHESIOLOGY**

**(BRANCH X)**

**REG NO: 201720756**



**GOVERNMENT THENI MEDICAL COLLEGE**

**THENI**

**MAY 2020**

## **CERTIFICATE**

This is to certify that the dissertation titled “**COMPARISON OF 0.125% ROPIVACAINE – DEXMEDETOMIDINE VERSUS 0.125% LEVOBUPIVACAINE – DEXMEDETOMIDINE FOR EPIDURAL LABOUR ANALGESIA**” is a Bonafide original work done by **DR. J. SUNDARAVADHANAM** during May 2017 - May 2020 in partial fulfilment of the requirements for M.D. (Anaesthesiology) Branch X- Examination of The Tamilnadu Dr.M.G.R. Medical University to be held in May 2020.

**Prof. DR.KANNAN BOJARAAJ,**  
**MD,DA**

Professor and Guide,  
Department of Anaesthesiology,  
Govt. Theni Medical College,  
Theni.

**Prof. DR.KANNAN BOJARAAJ,,**  
**MD,DA**

Professor and HOD,  
Department of Anaesthesiology,  
Govt. Theni Medical College,  
Theni.

**Prof. DR.K.RAJENDRAN, M.S., D.Ortho.,**  
Dean,  
Govt. Theni Medical College,  
Theni.

## **DECLARATION**

I **DR.J.SUNDARAVADHANAM** solemnly declare that this dissertation, titled “**COMPARISON OF 0.125% ROPIVACAINE – DEXMEDETOMIDINE VERSUS 0.125% LEVOBUPIVACAINE – DEXMEDETOMIDINE FOR EPIDURAL LABOUR ANALGESIA**” is a Bonafide record of work done by me in the Department of Anaesthesiology, Govt. Theni Medical College and Hospital, Theni under the guidance of **Prof. DR.KANNAN BOJARAAJ,M.D.**, Professor of Anaesthesiology, Govt. Theni Medical College & Hospital, Theni.

This dissertation is submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfilment of the University regulations for the award of degree of M.D.(Anaesthesiology), Branch X- examination to be held in MAY-2020.

Place: Theni

**DR.J.SUNDARAVADHANAM**

Date:

## ACKNOWLEDGEMENT

With deep sense of gratitude I thank **God almighty** for his grace and close presence, which strengthened and sustained me through this endeavour.

Perfection of work is possible only by the union of master brains, expertise hands and dedicated hearts of enthusiastic people at the right time. Thereby it gives me immense pleasure to thank all the contributors who added oil to the glowing lamp of my study from the time of its ignition. Their valuable contributions reflect in the perfection of this study

I wish to express my sincere thanks to **Prof. DR. K.RAJENDRAN, M.S., D.Ortho, Dean**, Govt. Theni Medical College, Theni and the former Dean **Prof. DR.T. THIRUNAVUKKARASU, M.D., D.A.**, for granting me permission to do my study in this esteemed institution.

I lend this opportunity to express my sincere heart full thanks and gratitude to **Prof. DR.KANNAN BOJARAAJ, M.D., D.A.**, Professor and Head of the Department of Anaesthesiology, Govt. Theni Medical College, Theni for his motivation, constant supervision and for providing all necessary arrangements for the conduct of the study, without which this dissertation would not have materialized.

I would like to place on record my indebtedness to my guide **Prof. DR.KANNAN BOJARAAJ, M.D., D.A.**, Professor and HOD of Anaesthesiology, Govt. Theni Medical College, Theni for her constant encouragement, constructive criticism and suggestions throughout the period of the study.

I express my profound thanks to **Prof. DR. S.VIJAYARAGAVAN ,MD.,DA., Prof.DR.M.BALASUBRAMANI, MD.,DA.,** and **Prof. Dr. M.BALAMURUGAN, MD.,** Department of Anaesthesiology, Govt. Theni Medical College, Theni for their wholehearted help and support in doing this study.

I am extremely thankful to **DR.K.R.UMARANI,** Assistant Professor of Anaesthesiology, Govt. Theni Medical College, Theni for his sagacious advice and appropriate guidance to complete this study.

I thank all the Assistant Professors and Senior Residents of Department of Anaesthesiology for their keen interest and encouragement during this study.

I thank all the Professors in the Department of Surgery, Orthopaedics, Obstetrics and Gynaecology, Govt. Theni Medical College, Theni for their able help and support during the course of the study.

I also wish to thank all my colleagues for their constant help during this study. My thanks are due to all the theatre personnel for their willing cooperation and assistance.

I am deeply grateful to all the patients included in the study, for their wholehearted co-operation inspite of their illness made this study possible.

I continue to be indebted to all for their support, guidance and care who directly and indirectly involved in my progress of work and for the successful completion of this study.

## ABSTRACT

### Introduction:

Labour pain which is an intolerable pain which made it an area of successful setting up of analgesia. Epidural analgesia which is normally used was having multiple local anaesthetic and adjuvant options. Ropivacaine and Levobupivacaine was the drugs which is commonly used in epidural analgesia. Dexmedetomidine is a drug which is used as an adjuvant to increase the efficacy.

### Objectives:

The study was aimed to compare Ropivacaine and Levobupivacaine with dexmedetomidine as adjuvant for epidural analgesia in labour regarding onset, quality and duration of analgesia, motor blockade, labour outcome.

### Methodology:

The study was done among 50 pregnant women nearing term where they got randomised into two groups. **Group A:** 10ml of 0.125% Ropivacaine with Dexmedetomidine (0.5mcg/kg body wt) as initial dose and 8ml of 0.125% Ropivacaine along with 0.5mcg/kg body wt of Dexmedetomidine as top up doses as and when required. **Group B:** 10ml of 0.125% Levobupivacaine with Dexmedetomidine (0.5mcg/kg body wt) as initial dose and 8ml of 0.125% Levobupivacaine with Dexmedetomidine (0.5mcg/kg body wt) as top up doses as and when required. Parameters recorded and assessed were time of onset of analgesia, duration of the epidural analgesia, duration of the first and second and total duration

of labour total amount of local anaesthetic used as top-up bolus doses, mode of delivery, foetal heart rate, APGAR scores of the newborn, patient complaints after epidural anaesthesia and Mean Arterial Pressure (MAP), Heart rate, Visual Analogue Pain Scale(VAS) of the subject.

## **Results:**

The mean (SD) age of the population among groups were 22(2.26) years for group 1 and 21.48(2.12) years for group 2 respectively. The minimum and maximum age of the population was 19 and 27 respectively. The mean (SD) gestational age in weeks of the population were 38.72(0.79) weeks and 38.96(0.89) weeks for group 1 and 2 respectively. The minimum was 37 and maximum was 41 weeks. The study was done among 100 subjects, 50 in each group. There is a significant association between number of top ups and groups. 3 top ups were required by 17(60.7%) of the subjects in group B compared to that of group A where only 11(39.35) required 3 top ups. There is a significant difference between the two groups in terms of time of onset of analgesia. Group A[11.36±1.35] is having lesser time to start the analgesia compared to group B [15.44±1.39]. This result is statistically significant. There is a significant difference between the duration of analgesia. Group B [180 min (167.50, 193)] was having increased duration of action compared to group A[160 min (150,170)]. There is a significant difference between the groups in term of mean arterial pressure at 5 min and 30 min.[5 minutes group A - 94.08±4.83, group B- 90.68±4.34] [30 min group A- 96.08±4.83Group B- 92.32±3.98]. And across other time periods the MAP was not significant between the groups. There is a significant difference between the groups in terms of heart rate at 60 min. Group A-86.04±6.48, Group B- 90.64±6.53.

And across other time periods the heart rate was not significant between the groups. There is no significant difference between both the groups in terms of VAS score across different time periods. None of the study patients in either of the groups underwent motor blockade in response to the epidural analgesia.

### **Conclusion:**

Ropivacaine with Dexmedetomidine was better in terms of shorter time for onset of action, lesser number of top ups and lesser heart rate at 60 minute. Levobupivacaine with Dexmedetomidine was better in terms longer duration of analgesia and reduced mean arterial pressure at 5 and 30 minute.

So it is concluded from the study that both the group of analgesic has comparable efficacy in terms of analgesic characteristics, but Levobupivacaine has longer anaesthesia duration which is useful for the effective functioning of labour and patient satisfaction.

## CONTENTS

<b>Sl. No.</b>	<b>Topic</b>	<b>Page No.</b>
<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Aim and Objectives</b>	<b>4</b>
<b>3</b>	<b>Review of Literature</b>	<b>4</b>
<b>4</b>	<b>Research Question or Hypothesis</b>	<b>31</b>
<b>5</b>	<b>Methodology</b>	
	<b>5.1. Study Subjects</b>	<b>32</b>
	<b>5.2. Study Design</b>	<b>32</b>
	<b>5.3. Study setting</b>	<b>32</b>
	<b>5.4. Sampling Procedure</b>	<b>32</b>
	<b>5.5. Inclusion Criteria</b>	<b>32</b>
	<b>5.6. Exclusion criteria</b>	<b>33</b>
	<b>5.7. Sample Size</b>	<b>33</b>
	<b>5.8. Study procedure</b>	<b>34</b>
	<b>5.9. Ethical Consideration</b>	<b>36</b>
	<b>5.10. Statistical Methods</b>	<b>37</b>
<b>6</b>	<b>Results</b>	<b>40</b>
<b>7</b>	<b>Discussion</b>	<b>79</b>
<b>8</b>	<b>Limitation</b>	<b>83</b>
<b>9</b>	<b>Recommendations</b>	<b>84</b>
<b>10</b>	<b>Conclusion</b>	<b>85</b>
<b>11</b>	<b>Bibliography</b>	<b>90</b>
<b>12</b>	<b>Annexures</b>	<b>102</b>

## LIST OF FIGURES

<b>Sl.No.</b>		<b>Page No.</b>
<b>1</b>	Figure 1: Pathways of labour pain	<b>6</b>
<b>2</b>	Figure 2: Effects of labour pain	<b>7</b>
<b>3</b>	Figure 3: Effects on the foetus	<b>8</b>
<b>4</b>	Figure 4: Different regions for labour analgesia	<b>14</b>
<b>5</b>	Figure 5: Epidural space	<b>18</b>
<b>6</b>	Figure 6: Ropivacaine	<b>20</b>
<b>7</b>	Figure 7: Levobupivacaine	<b>22</b>
<b>8</b>	Figure 8: Action of Dexmedetomidine	<b>24</b>
<b>9</b>	Figure 9: Schema of the study	<b>38</b>
<b>10</b>	Figure 10: Age distribution among the groups	<b>42</b>
<b>11</b>	Figure 11: Age categories distribution among the population	<b>44</b>
<b>12</b>	Figure 12: Weight distribution among the population	<b>45</b>
<b>13</b>	Figure 13: Height distribution among the population	<b>47</b>
<b>14</b>	Figure 14: BMI distribution among the population	<b>49</b>

<b>15</b>	Figure 15: BMI categories among the population	<b>50</b>
<b>16</b>	Figure 16: gestational age distribution	<b>52</b>
<b>17</b>	Figure 17: Mode of delivery among the population	<b>59</b>
<b>18</b>	Figure 18: Foetal heart rate among the population	<b>61</b>
<b>19</b>	Figure 19: APGAR rate among the population( 1 minute and 5 minute)	<b>63</b>
<b>20</b>	Figure 20: MAP among the population at different time periods	<b>64</b>
<b>21</b>	Figure 21: Heart rate among the population at different time periods	<b>66</b>
<b>22</b>	Figure 22: Visual Analogue Scale among the population at different time periods	<b>68</b>
<b>23</b>	Figure 23: Comparison of MAP among the groups across different time periods	<b>74</b>
<b>24</b>	Figure 24: Comparison of Heart Rate among the groups across different time periods	<b>76</b>
<b>25</b>	Figure 25: Comparison of VAS score among the groups across different time periods	<b>78</b>

## LIST OF TABLES:

<b>Sl.No.</b>		<b>Page No.</b>
<b>1</b>	Table 1: Indications and contraindication of regional analgesia	<b>15</b>
<b>2</b>	Table 2: Advantages and disadvantages of techniques	<b>15</b>
<b>3</b>	Table 3: Age distribution among the population	<b>41</b>
<b>4</b>	Table 4: Age categories distribution among the population	<b>43</b>
<b>5</b>	Table 5: Weight distribution among the population	<b>44</b>
<b>6</b>	Table 6: Height distribution among the population	<b>46</b>
<b>7</b>	Table 7: BMI distribution among the population	<b>48</b>
<b>8</b>	Table 8: BMI categories among the population	<b>50</b>
<b>9</b>	Table 9: Gestational age distribution among the population	<b>51</b>
<b>10</b>	Table 10: Cervical dilatation distribution among the population	<b>53</b>
<b>11</b>	Table 11: Dosage of top up distribution among the population	<b>54</b>

<b>12</b>	Table 12: Number of top ups among the groups	<b>54</b>
<b>13</b>	Table 13: Dosage of the comparing drugs distribution among the population	<b>55</b>
<b>14</b>	Table 14: Duration of labour distribution among the population	<b>56</b>
<b>15</b>	Table 15: Time of onset of analgesia among the population	<b>57</b>
<b>16</b>	Table 16: Duration of analgesia among the population	<b>58</b>
<b>17</b>	Table 17: Mode of delivery among the population	<b>58</b>
<b>18</b>	Table 18: Foetal heart rate among the population	<b>60</b>
<b>19</b>	Table 19: APGAR rate among the population( 1 minute and 5 minute)	<b>62</b>
<b>20</b>	Table 20: Complications after the administration of drug	<b>63</b>
<b>21</b>	Table 21: MAP among the population at different time periods	<b>64</b>
<b>22</b>	Table 22: Heart rate among the population at different time periods	<b>65</b>
<b>23</b>	Table 23: Visual Analogue Scale among the population at different time periods	<b>67</b>
<b>24</b>	Table 24: Baseline characteristics of both the groups	<b>69</b>

<b>25</b>	Table 25: Comparison of duration of labour among the groups	<b>70</b>
<b>26</b>	Table 26: Comparison of top up dosage and number of top ups among the groups	<b>70</b>
<b>27</b>	Table 27: Comparison of time of onset of analgesia and duration of analgesia among the groups	<b>71</b>
<b>28</b>	Table 28: comparison of APGAR (at 1 min and 5 min) among the groups	<b>72</b>
<b>29</b>	Table 29: Comparison of MAP among the groups across different time periods	<b>73</b>
<b>30</b>	Table 30: Comparison of Heart Rate among the groups across different time periods	<b>75</b>
<b>31</b>	Table 31: Comparison of VAS score among the groups across different time periods	<b>77</b>