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Comparative Study Of Local Anaesthtic Action Of Bupivacaine With Standard Xyolocaine In Rabbits And Guniea Pigs.

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Abstract:
Aims& objectives:*The present study was designed to compare the onset and duration of action of two local anaesthetics bupivacaine with standard xylocaine in rabbits surface anaesthesia and guinea pigs infiltration anaesthesia .*
Materials & methods: *8 albino rabbits of either sex weighing 2.5-3kgs and 6 guniea pigs of either sex weighing 200 -300gms were selected and different procedures have been extensively used in this work. However no other test known provides all the information required, so that one must be prepared to apply several different tests, each useful because of the information it provides. surface anesthesia is used to indicate relative speed of onset of anesthesia, rather than duration,*
Statistical Analysis: *All statistical tests carried out. Discrete valuable were compared on the basis of unpaired t-tests. P value was obtained (t=2.145) by chance is much less than 0.05 (p < 0.05), which is highly significant on Rabbits. P value was obtained (t=2.228) by chance is much less than 0. 05 (p < 0.05), which is highly significant on Guinea Pig.*
Results*: The result both groups were compared and studied. In these both drugs Bupivacaine is present rapid on set and prolong duration of action.*
Conclusion:
1. *Xylocaine shows the intermediate local anaesthetic action.*
2. *Bupivacaine shows the longer local anaesthetic action.*
3. *Xylocaine shows the slow on set and short duration of action.*
4. *Bupivacaine shows the earlier on set and long duration of action.*
Keywords: *Albino rabbits,Guniea pigs,Bupivacaine,Xylocaine, surface anaesthesia,Infiltration aneasthesia.*

I. Introduction

Local anesthetics are warranted whenever a clinical procedure causes pain that could be eliminated by their use . Their effectiveness is influenced by many factors, particularly the choice of agent and the technique of administration.[1] Local anesthesia is useful in a wide variety of clinical situations. It increases patient conform and facilitates patient cooperation during procedures. As a diagnostic aid, it helps localize or identify the source of pain. Use of local anaesthesia in the primary care setting can be maximized by an understanding of how anesthetic agents work, the indications for their use, appropriate methods of administration, and techniques to minimize the pain of administration. Several local anaesthetic drugs are available. It is important to become thoroughly familiar with the commonly used ones. Lignocaine (Xylocaine/,Lidocaine) is now one of the most popular local anesthetic agents. Bupivacaine (Marcaine) is used when more prolonged anaesthesia is required. Levobupivacaine [14] (Chirocaine) and Ropivacaine[6] (Naropin) are recently introduced drugs with similar properties to bupivacaine bu less toxic. Amethocaine[6] is also useful and available in many countries. Local anaesthetic are used mostly in the form of hydrochlorides[12]. The alkaline[4] tissues to release the bases which then combine with the nerve tissues. In infected tissues the acid of the pus makes these drugs less active. Comparative information regarding different clinically[3] used local anesthetics is not available readily especially their relative potency, efficacy and duration. This work is an attempt to throw light in this regard on different laboratory animals, which may be interpolated, to human beings.

II. Methodology

The animal models used in this study were:
a) Surface anesthesia[9] in Rabbits[5]
b) Infiltration anesthesia in Guinea pigs.[5]

Two different procedures have been extensively used in this work. However no other test known provides all the information required, so that one must be prepared to apply several different tests, each useful because of

the information it provides. . Corneal anesthesia[5]&[22] is an. indication not only of anesthetic potentiality, but also of the ability of the agent to penetrate the layers of cells. (Penetration on topical application depends on the presence of significant proportion of un dissociated molecules) In some respects the intra dermal wheal[7] test offers distinct advantages over either of those mentioned above local anesthetic potency on topical application.

III. Inclusion Criteria

Only Rabbits and Guinea Pigs were selected . Both male and female Rabbits and Guinea Pigs were eligible. All the Rabbits should have the weight between 2.5 to 3 kgs and all the Guinea Pigs should have the weight between 200-300 grams. All the Rabbits and Guinea Pigs should be diseased free, both are active and healthy.

3.1.Animals : Rbbits and Guinea pigs. These are employed in the study of Local anaesthetic.

3.2.Drugs: XYLOCAINE 2% , BUPIVACAINE 0.5% .

3.3. Method: Rabbits group was given surface anaesthesia on the cornea test[7][21]&[22] on Bupivacaine & Xylocaine readings were noted at every 5 min interval.

Guinea Pigs group was given infiltration anaesthesia of the wheal test[7][23]&[24] on Bupivacaine & Xylocaine readings were noted at every 5 min interval.

3.4.Parameteres: On set of action and Duration of action.

3.5.**Statistical Analysis:** All statistical tests carried out. Discrete valuable were compared on the basis of unpaired[5] t-tests. P value was obtained (t=2.145) by chance is much less than 0.05 ($p < 0.05$), which is highly significant on Rabbits. P value[5] was obtained (t=2.228) by chance is much less than 0. 05 ($p < 0.05$), which is highly significant on Guinea Pig.

IV. Results

Table1&2: Observation of xylocaine and bupivacaine action on guinea pigs.

Xylocaine On Guinea Pigs

No. of Animals	Drug Concentration	On set of action	Observation of action
1	6.25µgr/ml	6.6 min	82 min
2	12.5 µgr/ml	13.3 min	27.5 min
4	50 µgr/ml	5 min	30 min
5	100 µgr/ml	5 min	54.16 min
6	200 µgr/ml	5 min	52.5 min

Bupivacaine On Guinea Pigs

No. of Animals	Drug Concentration	On set of action	Duration of action
1	6.25µgr/ml	6.6 min	35.8 min
2	12.5 µgr/ml	5 min	65 min
3	25 µgr/ml	5 min	63.3 min
4	50 µgr/ml	5 min	69.16 min
5	100 µgr/ml	5 min	62.5 min
6	200 µgr/ml	5 min	56.6 min

Table 3 & 4: Observation of 0.008% concentration[5] of xylocaine and bupivacaine action on rabbits.

Xy locaine On Rabbits

No. of Animals	Drug Concentration	On set of action	Observation of action
1	0.008%	25 min	50
2	0.008%	20 min	45
3	0.008%	20 min	45
4	0.008%	15 min	40
5	0.008%	20 min	45
6	0.008%	20 min	45
7	0.008%	15 min	40
8	0.008%	20 min	45

Bupivacaine On Rabbits

No. of Animals	Drug Concentration	On set of action	Duration of action
1	0.008%	15 min	65
2	0.008%	10 min	60
3	0.008%	10 min	60
4	0.008%	10 min	60
5	0.008%	10 min	60
6	0.008%	10 min	60
7	0.008%	10 min	60
8	0.008%	10 min	60

STATISTICS RESULTS:

Table 5&6: Mean,standard error of mean,standard deviation[5] values were compared with xylocaine and bupivacaine in guinea pigs.

Xylocaine On Guinea Pigs

	MEAN	STANDARD ERROR OF MEAN	STANDARD DEVIATION
ON SET OF ACTION	7.48	1.4	3.43
DURATION OF ACTION	46.6	8.66	20.79

Bupivacaine On Guinea Pigs

	Mean	Standard Error Of Mean	Standard Deviation
On Set Of Action	5.26	0.27	0.67
Duration Of Action	58.72	8.34	20.03

Table 7&8: Mean,standard error of mean,standard deviation values were compared with xylocaine and bupivacaine in Rbbits.

Xylocaine On Rabbits

	Mean	Standard Error Of Mean	Standard Deviation
On Set Of Action	19.3	1.14	3.21
Duration of action	44.3	1.14	3.20

Bupivacaine On Rabbits

	Mean	Standard Error Of Mean	Standard Deviation
On Set Of Action	10.62	0.61	1.73
Duration Of Action	60.62	0.62	1.76

Table 9; Comparison of onset and duration of action of xylocaine and bupivavacaine on infiltration anaesthesia in Guinea pigs.

Comparison Of Xylocaine And Bupivacaine On Guinea Pigs

	On set of action	Duration of action
Xylocaine on Guinea Pigs	7.48	46.6
Bupivacaine on Guinea Pigs	5.26	58.72

Table 10: Comparison of onset and duration of action of xylocaine and bupivavacaine on surface anaesthesia in rabbits.

Comparison Of Xylocaine And Bupivacaine On Rabbits

	On set of action	Duration of action

Xylocaine on Rabbits	19.3	44.3
Bupivacaine on Rabbits	10.62	60.62

V. Discussion

The comparative study of on set and duration of action of Xylocaine and Bupivacaine which are Local Anaesthetics used commonly in practice, done on Rabbit eye and Guinea Pig skin as surface and infiltration anaesthesia respectively. According to the results obtained through this experiment the on set of action of Bupivacaine is early and duration of action is longer than that of Xylocaine, which is depicted in the Bar diagram. The on set of action of Bupivacaine is 2.12 minutes earlier that that of Xylocaine as infiltration anaesthetic and the duration of action of Bupivacaine is 12.12 minutes than that of Xylocaine. As surface anaesthetic, the on set of action of Bupivacaine is 8.68 minutes earlier than that of Xylocaine and the duration of action Bupivacaine is 16.32 minutes longer than that of Xylocain.

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