

# Comparison of Dexmedetomidine 50 $\mu$ g versus 100 $\mu$ g added to 0.5% Levobupivacaine in Supraclavicular Brachial Plexus Block (BPB) for Arteriovenous Fistula (AVF) Surgery

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# INTRODUCTION

- AVF Surgery : a procedure to attach the vein to the artery & prepare a patient for hemodialysis.
- Normally done under LA
- Alternatively, it can be done under RA, with better analgesia coverage.
- Currently various drugs has been proven to be effective adjuncts to brachial plexus block: opioids, clonidine, neostigmine, and tramadol.

(DB. Murphy, Anesth Analg 2000)

# INTRODUCTION

- The search on a suitable LA + additive which is faster in onset, longer duration, stable haemodynamically, and better in safety profile is still in progress.

# INTRODUCTION

- Dexmedetomidine (dex) is one of the latest  $\alpha_2$ -agonist.
- provides sedation without causing respiratory depression.
- Normally used as sedation in anaesthesia & ICU.
- Studies on the effect of dexmedetomidine as additive in brachial plexus block is still on-going.



# DEXMEDETOMIDINE

1. **High lipid solubility** - rapidly absorbs and binds to the  $\alpha_2$  receptor of the nerves for faster analgesic effect.
2. **Central and peripheral enhancement** of LA activity causing prolongation of nerve block.

(Schneider et al. 2005,  
Kanazi et al. 2006)

# OBJECTIVE

- To compare the effect of adding Dexmedetomidine 50 $\mu$ g versus 100 $\mu$ g to 0.5% Levobupivacaine in Supraclavicular BPB for AVF Surgery in terms of:
    1. **Onset** and **Duration** of block,
    2. **Sedation effect** and **Haemodynamic** parameters,
    3. Changes in Vascular **diameters**.
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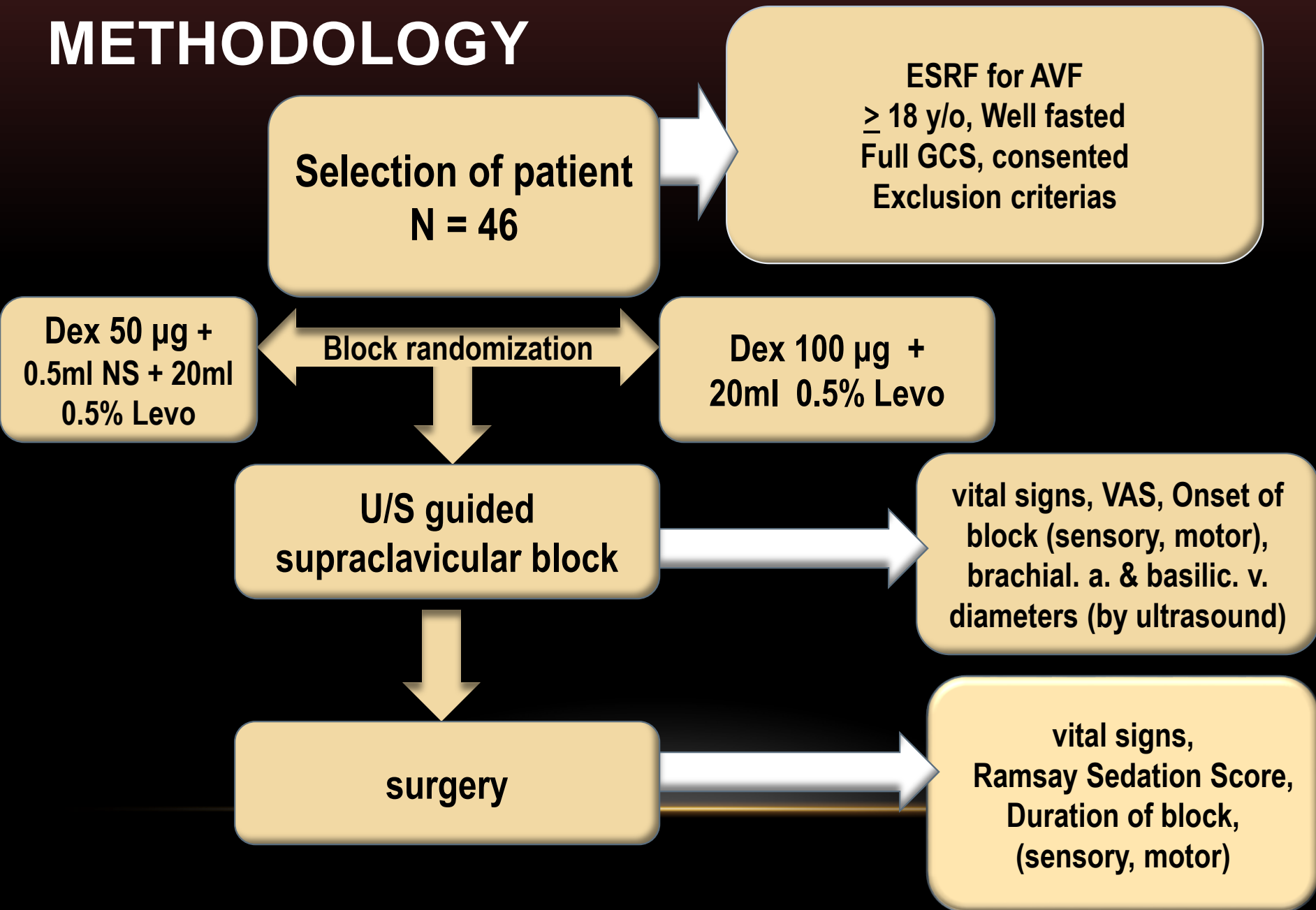
# STUDY DESIGN

- Double blinded RCT, done in OT HUSM after ethical committee approval.
- Sample size calculated by using the difference of means from Esmaloglu's study (2010) which compare:

Dex 100 $\mu$ g versus placebo added to Levobupivacaine in Axillary Block. (ESRF patient were excluded)

- Alpha = 0.05 ( level of significance )
- Power = 0.8
- Mean onset time in placebo ( $\mu_1$ ) 9.13
- Difference in mean 10.46-9.13 = 1.33min (SD)
- Sample size is **23 patients for each arm.**

# METHODOLOGY

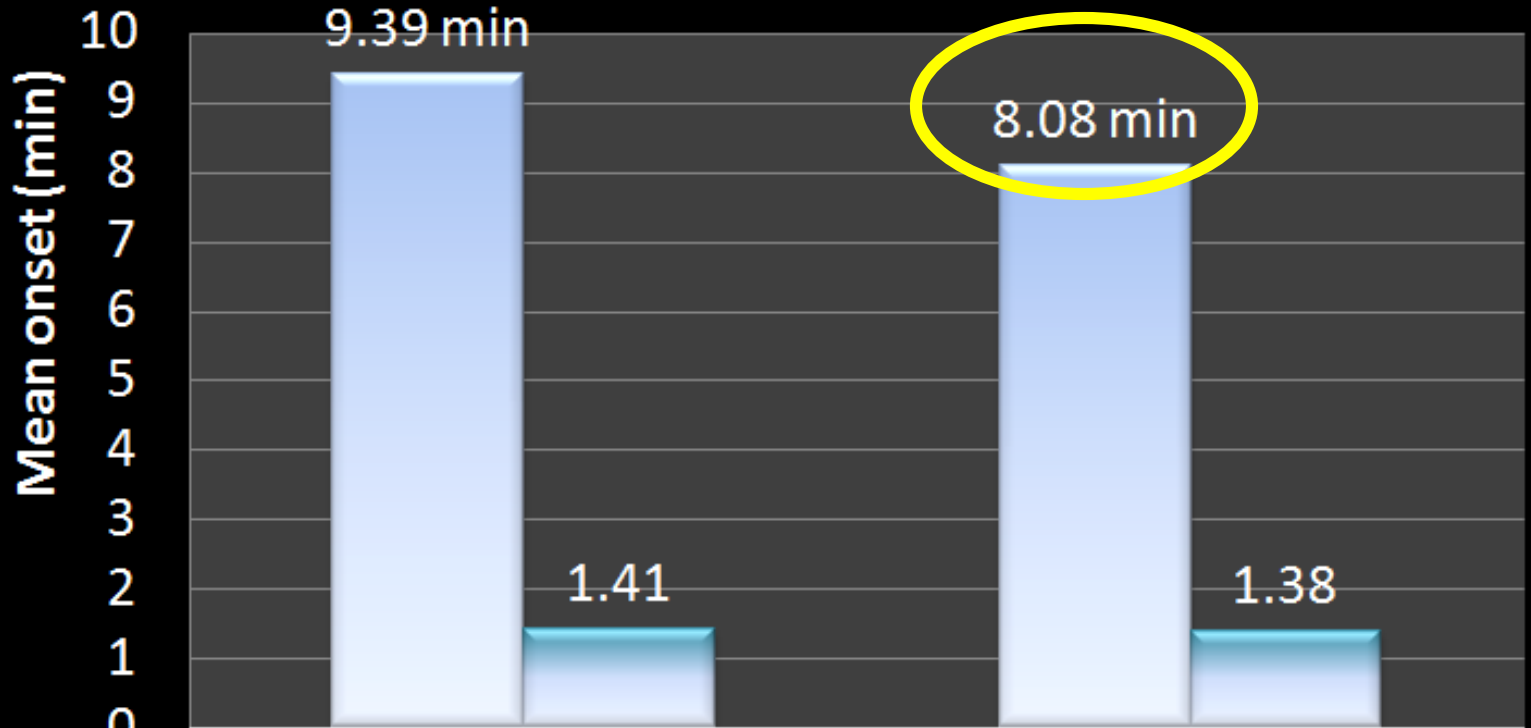




# RESULT

- Demographic Data:
  - No significant differences between the two groups in terms of age, gender, weight and height.

# Onset of Sensory Block

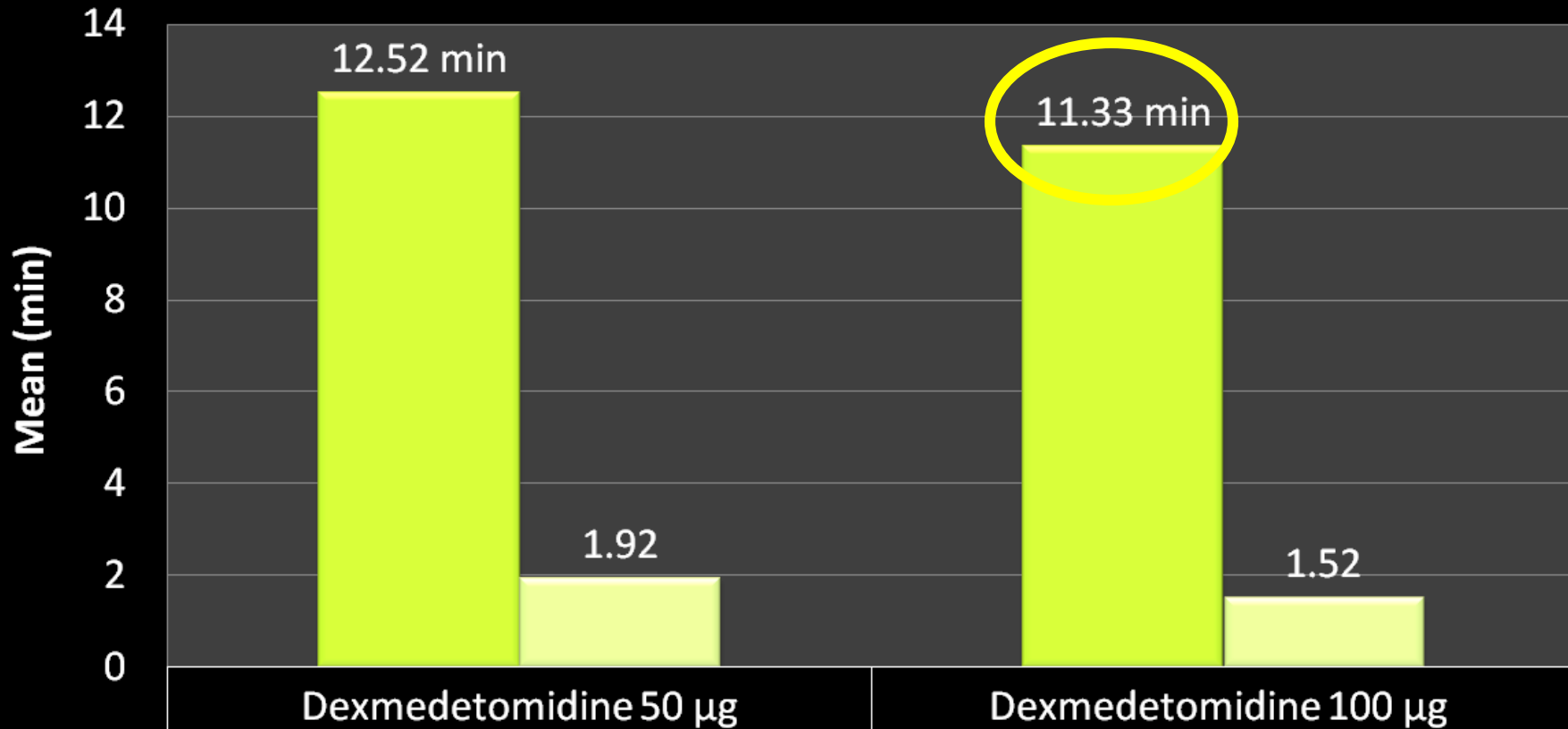


	Dexmedetomidine 50 µg	Dexmedetomidine 100 µg
Mean (min)	9.39	8.08
SD	1.41	1.38
P value *	0.002**	

\* Independent T-test

\*\* Statistically significant

# Onset of Motor block

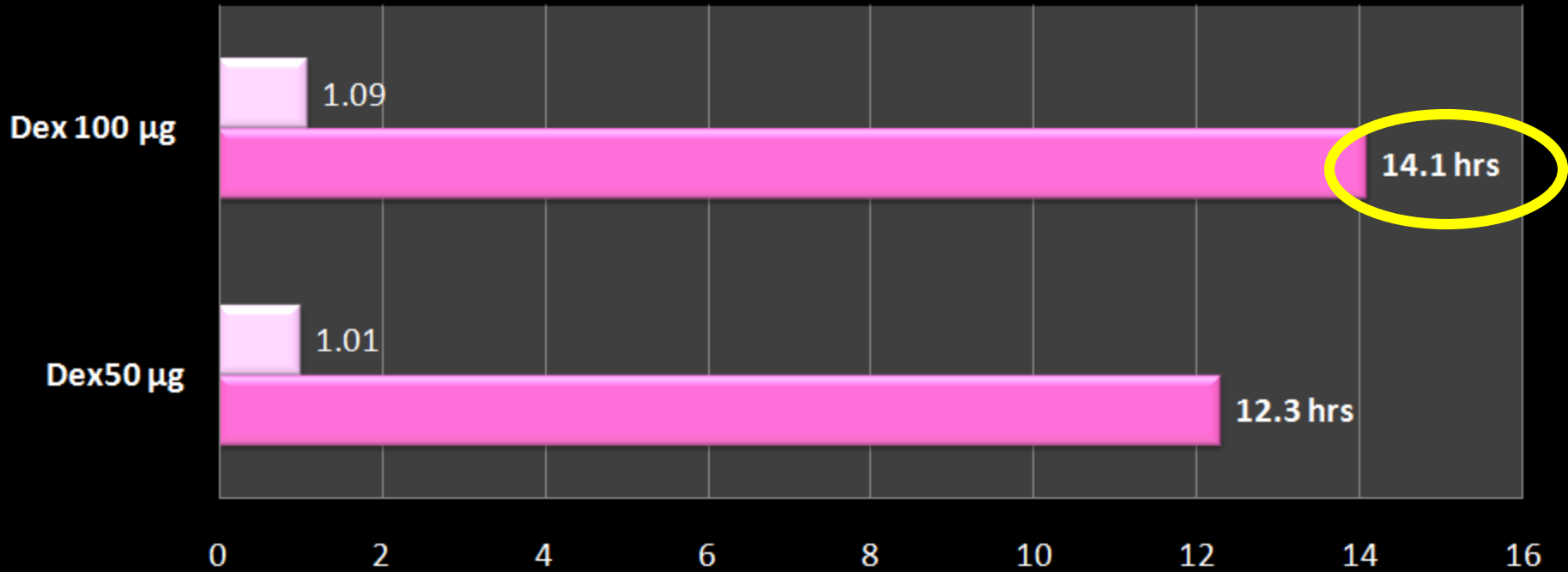


Mean (min)	12.52	11.33
SD	1.92	1.52
P value *	0.024**	

\* Independent T-test

\*\* Statistically significant

## Duration of Motor Block

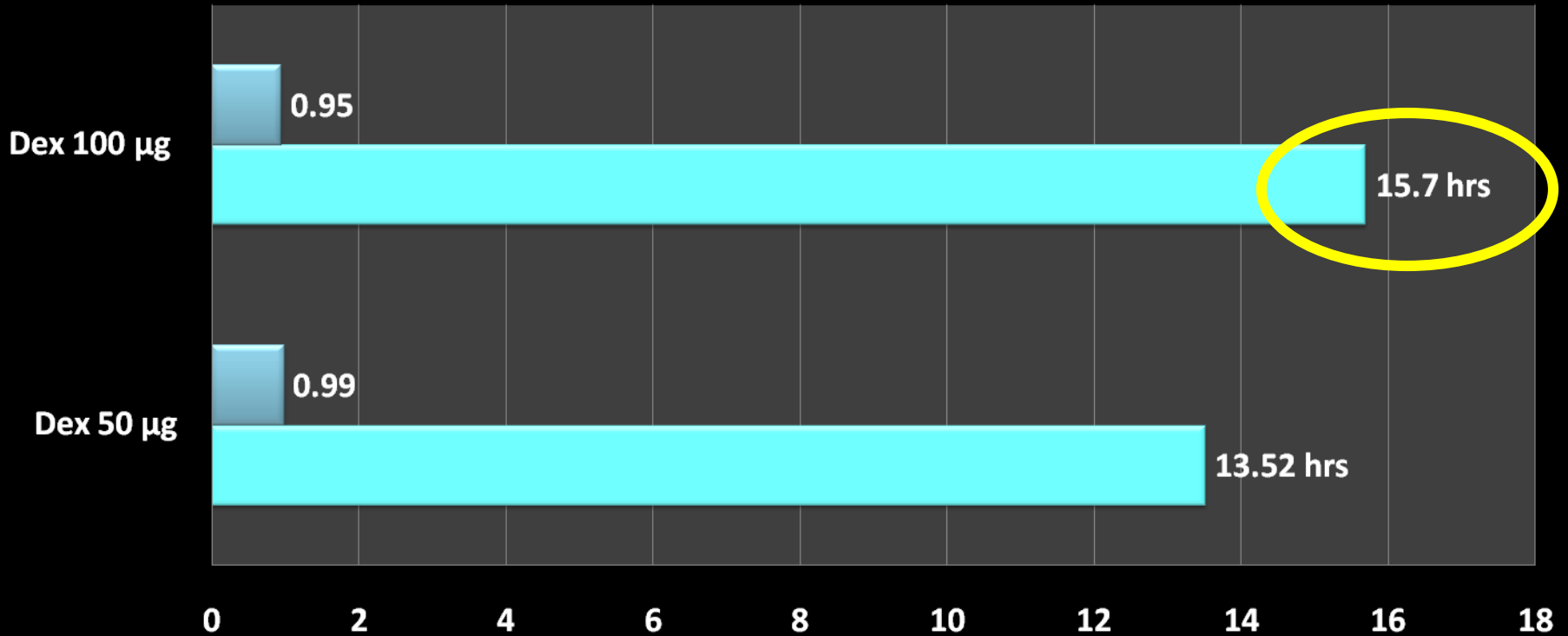


	Dex50 µg	Dex 100 µg
■ SD	1.01	1.09
■ Mean (hr)	12.3	14.1
P value *	<b>&lt;0.001**</b>	

\* Independent T-test

\*\* Statistically significant

# Duration of sensory block

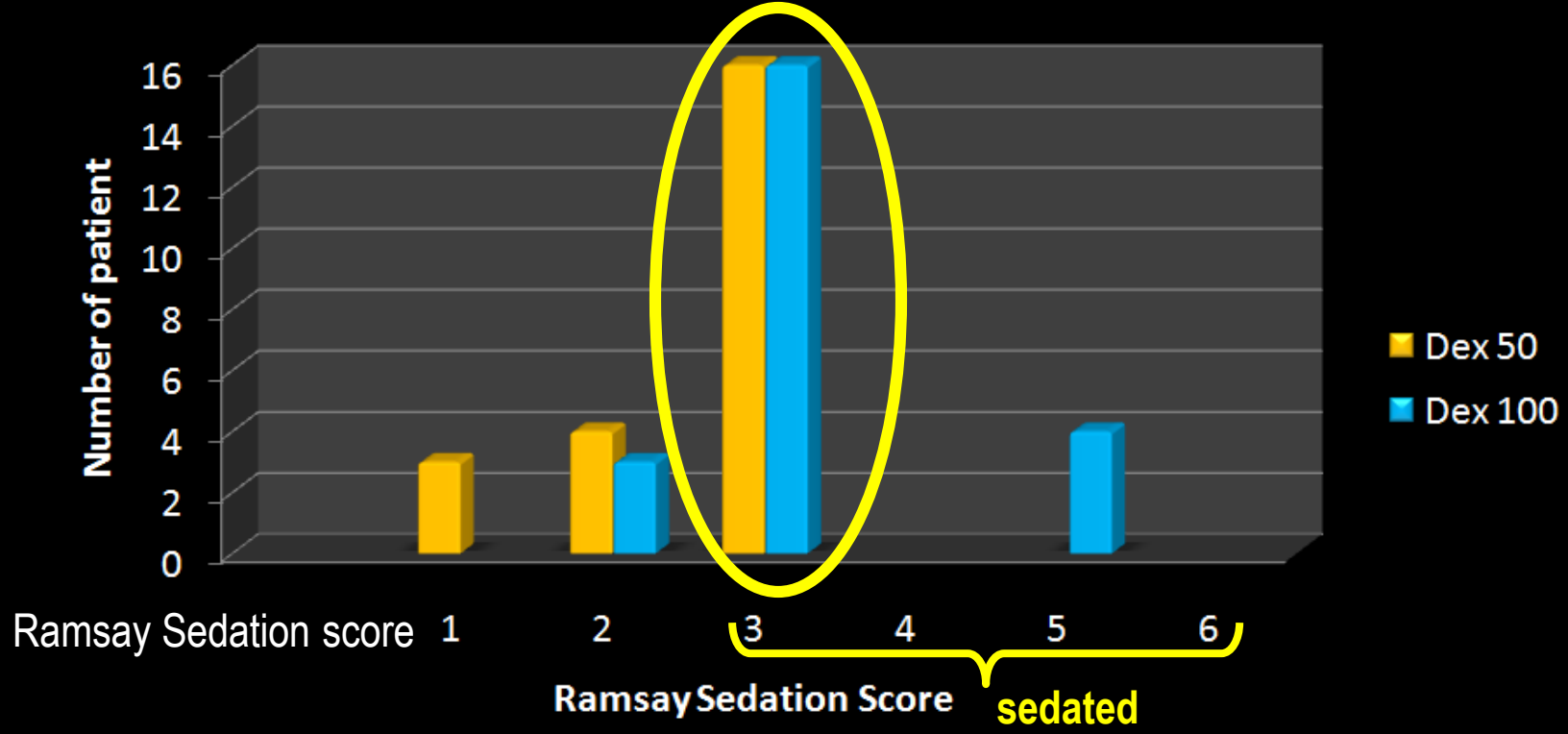


	Dex 50 µg	Dex 100 µg
SD	0.99	0.95
Mean (hr)	13.52	15.7
P value *	0.002**	

\* Independent T-test

\*\* Statistically significant

# Degree of Sedation for 50µg vs 100µg Dexmedetomidine Group



## Comparison in Degree of Sedation Pre and Post Block 20 Minutes

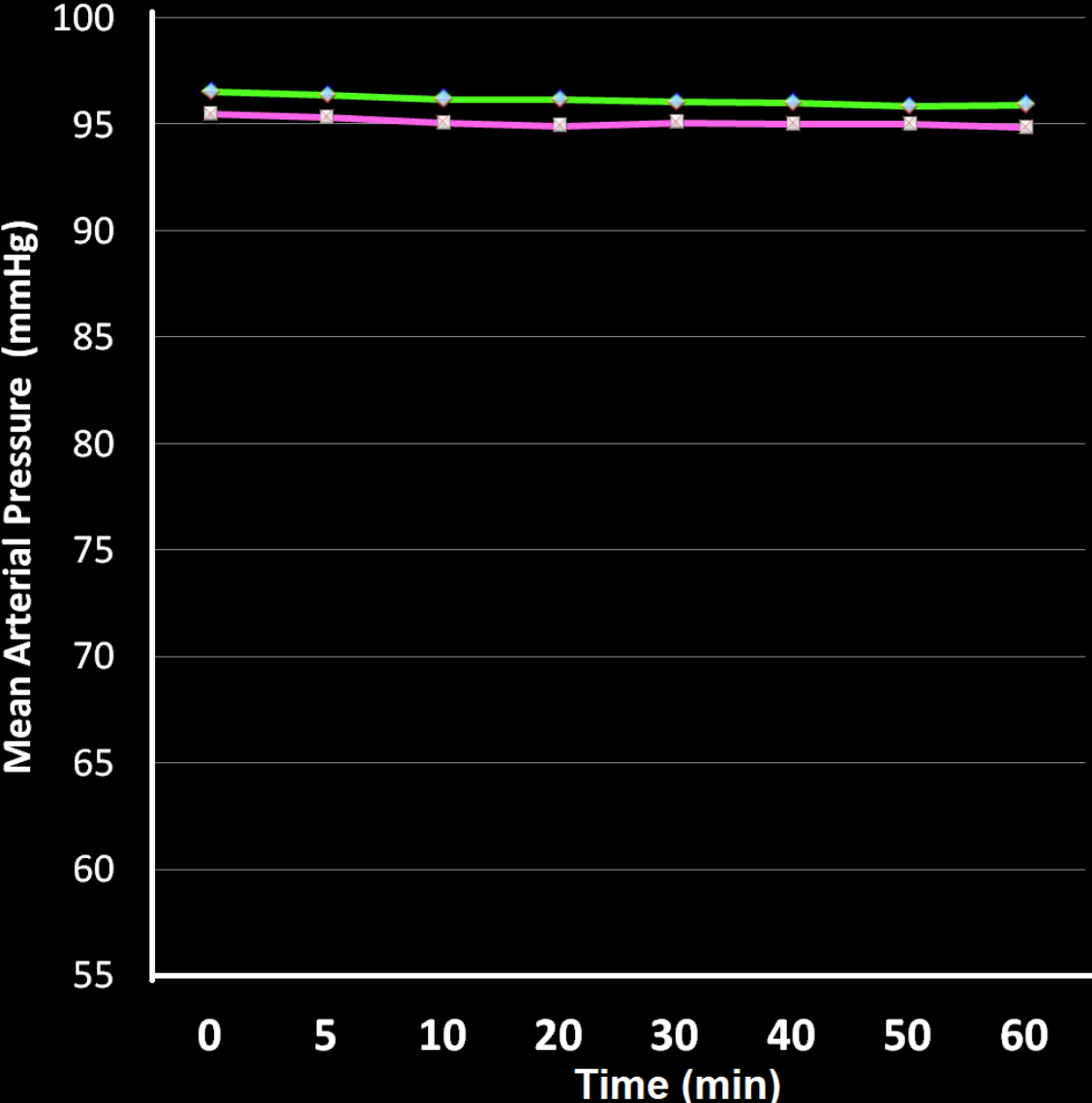
	Comparison between group (N=46)	p-value*
	Percentage of Sedation	SD
Dexmedetomidine 50ug	70%	0.0067
Dexmedetomidine 100ug	87%	0.0074

**0.47\*\***

\*Chi-Square  
 \*\* **Statistically not significant**

# MEAN ARTERIAL PRESSURE COMPARISON

MAP between Dex50µg vs Dex100µg

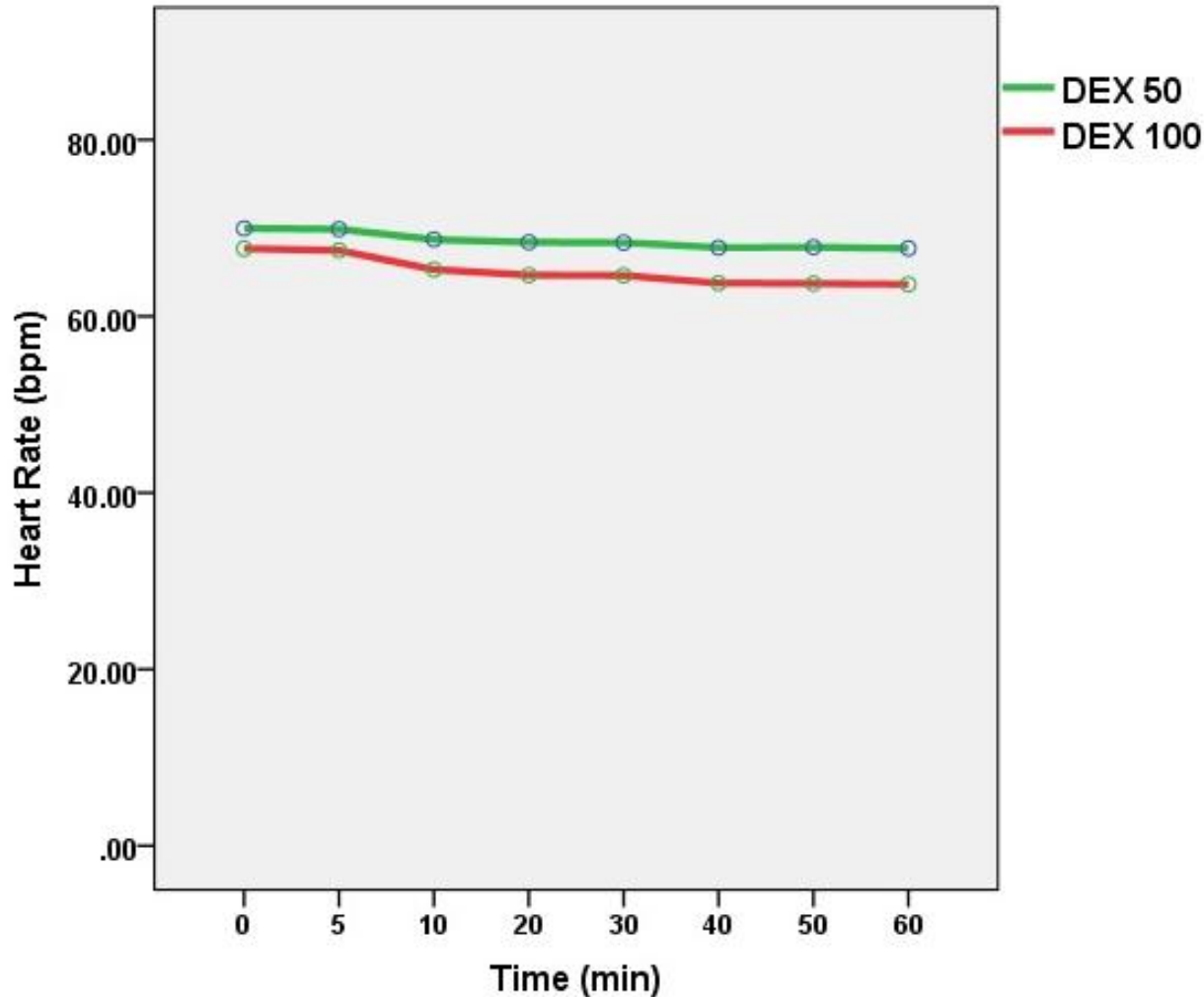


Repeated Measure ANOVA:

**Statistically not significant**  
**( $p=0.581$ )**

● DEX 50  
■ DEX 100

# HEART RATE COMPARISON



Repeated Measure ANOVA:  
**Statistically not significant**  
**( $p=0.078$ )**



# VESSEL DIAMETER DIFFERENCE PRE & POST BLOCK

Vessel	DEX 50	DEX 100	<i>t</i> (44)	<i>p</i> -value
	Mean (SD)	Mean (SD)		
Brachial artery	0.020 (0.0067)	0.025 (0.0059)	2.55	0.014*
Basilic Vein	0.022 (0.0074)	0.027 (0.0062)	2.60	0.013*

\* Statistically significant

# DISCUSSION

- Result was similar to Esmagoğlu's 2010 study, where Dexmedetomidine 100µg versus placebo were added to 0.5% Levobupivacaine in Axillary Block.
- Dexmedetomidine 100 µg added to 0.5% Levobupivacaine in supraclavicular BPB has a faster onset & longer duration in terms of sensory & motor block.

# DISCUSSION

- The degree of sedation and vital signs does not significantly differ in both groups.
  - However, Dexmedetomidine 100µg causes significant vasodilatation than 50µg group.
  - This will ease the surgery & may result in an increased successful rate for AVF creation.
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# CONCLUSION

The addition of dexmedetomidine as an adjuvant for BPB:

- ✓ fasten the onset and prolong the duration of analgesia.
- ✓ produce sedative effect with stable haemodynamic parameters.
- ✓ increase the artery and vein diameters to ease AVF surgery.

**THANK YOU**

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