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MEPIVACAINE SPINAL ANESTHESIA FACILITATES SHORTER LENGTH OF STAY AND FEWER URINARY COMPLICATIONS IN TOTAL HIP ARTHROPLASTY COMPARED TO BUPIVACAINE

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DISCLOSURES

- No relevant disclosures



BACKGROUND

- Rapid rehab THA
 - Surgical technique
 - Perioperative protocol
- Outpatient surgery increasing
- Spinal anesthesia mainstream
- Paucity of evidence - optimal anesthetic for rapid rehab/ambulatory THA.



SPINAL ANESTHESIA

- Low cost (\$5)
- No airway manipulation
- Sufficient/reliable anesthesia for the duration of the procedure
- Rapid return of motor and sensory function
 - Early mobilization
- Safe rapid discharge with low risk of readmission
- Minimal risk of side effects such as urinary retention and transient neurologic symptoms (TNS).



PURPOSE:

To compare **spinal mepivacaine vs bupivacaine:**

- Assess for use in ambulatory total hip arthroplasty
- Recovery profile
 - Urinary retention/incontinence
 - Pain (VAS? Opioid?)
 - Nausea/vomitting
 - TNS
 - Length of stay



METHODS:

- IRB approval
- Retrospective review of prospectively collected data
- Single surgeon experience (12/2015 – 3/2018)
- Inclusion criteria
 - Primary THA for OA
 - Spinal anesthesia
- Exclusion criteria
 - PONV
 - Urinary retention/BPH



METHODS

- **312 primary THA patients under spinal/sedation:**
 - 116 received 3.0-3.4 mL of 2% mepivacaine
 - 195 received 10.5-12mg 0.75% bupivacaine
- Patients otherwise followed rigid THA pathways
 - Multimodal oral pain regimen
 - Periarticular injection
 - No foley catheters
 - Early mobilization

	Bupivacaine 0.75% vial		Mepivacaine 2% vial	
Height	Volume (mL)	Dose (mg)	Volume (mL)	Dose (mg)
4'10" – 5'7"	1.4	10.5	3	60
>5'7"	1.6	12	3.4	68

METHODS

- **Outcome measures by phase of care**
 - Pain VAS
 - Opioid consumption
 - N/V
 - Urinary retention
 - TNS
 - Discharge readiness
 - LOS



DEMOGRAPHICS

Variable	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	<i>P</i>
Age	63.7 ± 11.0	62.8 ± 10.6	64.3 ± 11.3	.240
Gender				
Male	137 (44%)	52 (45%)	85 (44%)	.832
Female	174 (56%)	64 (55%)	110 (56%)	
Race				
Caucasian	225 (72%)	86 (74%)	139 (71%)	.954
Black	68 (22%)	24 (21%)	44 (23%)	
Unknown	12 (4%)	4 (3%)	8 (4%)	
Asian	4 (1%)	1 (1%)	3 (2%)	
Hispanic	2 (1%)	1 (1%)	1 (1%)	
Smoker				
Never	161 (52%)	60 (52%)	101 (52%)	.780
Previous	112 (36%)	40 (34%)	72 (37%)	
Current	38 (12%)	16 (14%)	22 (11%)	
Body mass index	30.3 ± 6.2	30.0 ± 5.8	30.5 ± 6.4	.461
ASA				
1	10 (3%)	4 (3%)	6 (3%)	.450
2	127 (41%)	53 (46%)	74 (38%)	
3	168 (54%)	56 (48%)	112 (57%)	

DISCHARGE/LENGTH OF STAY

Variable	Response	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	P
Time in the PACU (minutes)	N Mean ± SD		116 114.9 ± 47.8	195 115.3 ± 45.1	.802
Hours inpatient	N Mean ± SD	311 17.6 ± 4.6	116 25.9 ± 14.1	195 35.7 ± 17.5	<.001
Length of stay (days)	N Mean ± SD	311 1.1 ± 0.7	116 0.9 ± 0.7	195 1.3 ± 0.7	<.001
Same-day discharge	No	276 (89%)	89 (77%)	187 (96%)	<.001
	Yes	35 (11%)	27 (23%)	8 (4%)	



LENGTH OF STAY - MULTIVARIATE

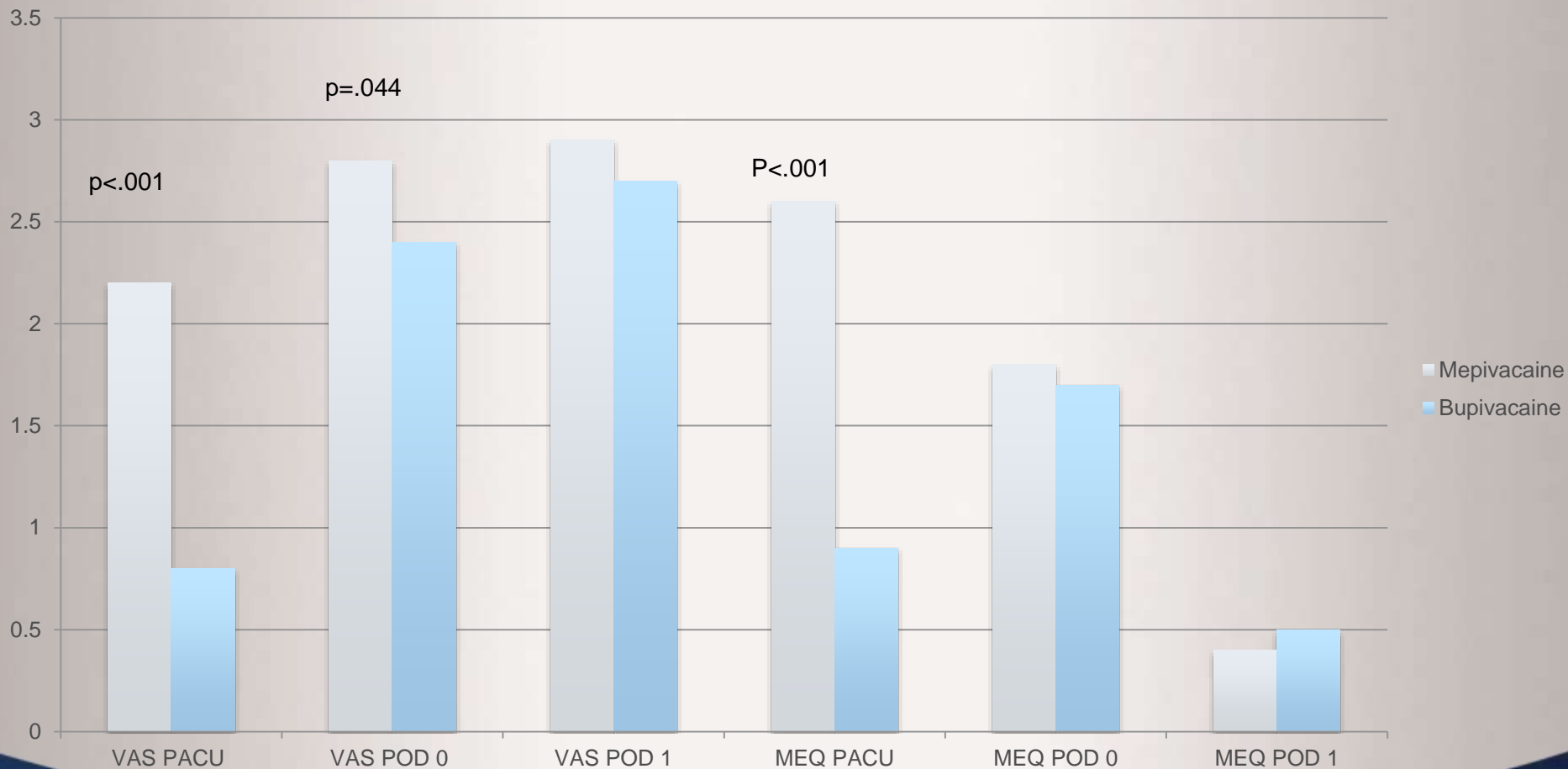
Predictor	Adjusted LS Means (SE) of LOS	<i>P</i>
Bupivacaine	1.19 (0.15)	<.001
Mepivacaine	0.90 (0.15)	

Predictor	Adjusted LS Means (SE) of Hours Inpatient	<i>P</i>
Bupivacaine	45.79 (3.94)	<.001
Mepivacaine	38.20 (4.14)	

Predictor	Adjusted OR (95% CI) for Same-Day Discharge = Yes	<i>P</i>
Bupivacaine	Ref	<.001
Mepivacaine	9.67 (3.72, 25.15)	



PAIN CONTROL



PAIN CONTROL - MULTIVARIATE

Predictor	Adjusted LS Means (SE) of VAS	P-Value
Bupivacaine	1.96 (0.24)	0.523
Mepivacaine	2.65 (0.25)	

Predictor	Adjusted LS Means (SE) of MEQ	P-Value
Bupivacaine	0.64 (0.22)	<0.001
Mepivacaine	1.17 (0.23)	



URINARY DATA

DETRUSOR LAST TO RETURN AFTER SPINAL

Variable	Response	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	<i>P</i>
Urinary catheter	No	299 (96%)	116 (100%)	183 (94%)	.009
	Yes	11 (4%)	0 (0%)	11 (6%)	

*Significantly **less foley placement** needed in the mepivacaine group.



COMPLICATIONS

- Zero episodes of TNS or anesthesia conversions

Variable	Response	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	<i>P</i>
Postoperative event	None	266 (87%)	94 (84%)	172 (88%)	.598
	Emergency	29 (9%)	13 (12%)	16 (8%)	
	Department Visit				
	Readmission	8 (3%)	4 (4%)	4 (2%)	
	Fracture	4 (1%)	1 (1%)	3 (2%)	

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Mahan MC¹, Jildeh TR¹, Tenbrunsel TN², Davis JJ¹.

- Shorter LOS
- Less urinary retention
- No difference in pain control (VAS/Opioid)
- No difference in PT performance
- No intubations
- No TNS episodes



CONCLUSION

- Mepivacaine is a suitable anesthetic for rapid recovery total hip arthroplasty
- Greater chance of same day discharge
- Shorter LOS
- Less urinary retention
- Significantly more pain in PACU, does not reach MCID
- No TNS symptoms

