Prophylactic treatment of Neostigmine and Atropine to Postdural Puncture Headache in obstetrics: A Randomized Controlled , Double-blind Trial

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Backgroud

- Accidental dural puncture (ADP) is one of the most common complications associated with epidural for labor analgesia
- Treatment with an epidural blood patch(EBP) for PDPH has been demonstrated to immediately reduce VAS scores , but it may lead to chronic backache and neurological complications
- Obstetric anesthetists are eager to develop effective treatments with fewer complications
- Neostigmine and atropine effectively treats post-dural puncture headache (PDPH) following spinal anaesthesia by reducing the VAS score and preventing persistent headaches
- To evaluate the effect of prophylactic treatment of neostigmine/atropine (NE) on the incidence of PDPH among obstetric patients with an accidental dural puncture (ADP)

Study design and methods

- This randomized clinical trial was conducted at a tertiary hospital in China
- Epidural analgesia during labour in this trial if confirmed accidental dural puncture (ADP) occurred were enrolled
- Prophylactic NE treatment group(of which 36 received slow IV injection of 20 μg/kg neostigmine and 10 μg/kg atropine in 10mL of 0.9% saline after delivery)
- Control group (37 received slow IV injection of 10mL of 0.9% saline after delivery).
- Primary outcome was the incidence of PDPH
- Secondary outcomes included a visual analog scale score for headache, the requirement for an epidural blood patch (EBP) and length of hospital stay
- Side effects of NE, such as, neck stiffness, dizziness, nausea and vomiting, diarrhea, abdominal cramps, abdominal pain, muscle twitches, tongue numbness

Results

- **Primary outcome：** The incidence of PDPH was lower in the prophylactic NE treatment group than in the control group ($p<0.001$)
- **Secondary outcomes：** The VAS was significantly lower in the prophylactic neostigmine/atropine treatment group than in the control group at 48, 72 and 96 hours, $p<0.05$
- Prophylactic NE treatment group exhibited a lower incidence of neck stiffness, abdominal cramps, muscle twitches, tongue numbness
- No patient received an epidural blood patch.
- No significant difference between two groups

eTable 1 Primary Outcomes (Incidence of PDPH) between the prophylactic neostigmine/atropine treatment group and the control group. (Postdural Puncture Headache).Values are number (proportion). NE, neostigmine/atropine; CI,confidence interval.

	Control (n=37)	Prophylactic NE treatment group(n=36)	Odds Ratio(95% CI)	P Value
PDPH,n(%)	30(81.1)	8(22.2)	0.067[0.021,0.208]	<0.001

eTable 2 The median difference for the VAS score between the prophylactic neostigmine/atropine treatment group and the control group. Values are median (range). NE, neostigmine/atropine; CI, confidence interval;VAS, visual analog scale.

	Control (n=37)	Prophylactic NE treatment group(n=36)	Median Difference (95% CI)*	P Value
VAS score at 24h after delivery, median (IQR)	0[0,0]	0[0,3]	0[0,0]	0.818
VAS score at 48h after delivery, median (IQR)	0[0,9]	0[0,0]	0[0,0]	0.006
VAS score at 72h after delivery, median (IQR)	7[0,10]	0[0,8]	6[5,8]	<0.001
VAS score at 96h after delivery, median (IQR)	1[0,6]	0[0,6]	0[0,2]	0.016
VAS score at 120h after delivery, median (IQR)	0[0,6]	0[0,6]	[0,0]	0.719
VAS score at 144h after delivery, median (IQR)	0[0,1]	0[0,0]	[0,0]	0.941

Conclusion and discussion

- Prophylactic neostigmine/atropine treatment following ADP was associated with reduced the incidence of PDPH and lower VAS scores
- Prophylactic administration of neostigmine/atropine was found to be associated with a reduced incidence of potential clinical side effects related to the use of these drugs
- Utilization of neostigmine/atropine may present a promising alternative for the prevention and treatment of PDPH

References

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