2. SPINAL ANESTHESIA WITH TETRACAINE IN 7.5% OR 0.75% GLUCOSE IN ADOLESCENTS VERSUS ADULTS

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Background: The influence of age on the extent of spinal anesthesia is still controversial. A recent study showed that adolescents developed a higher level of analgesia than adults when hyperbaric tetracaine was used. Since the baricity of the local anesthetic solution may influence the spinal level, understanding how solutions of different baricities act in adolescents is necessary. Accordingly, the current study was conducted to examine whether adolescents and adults might develop different anesthetic distribution and hemodynamic consequences after spinal injection of 0.5% tetracaine in 7.5% or 0.75% glucose.

Methods: After institutional review board approval and written informed consent, we studied 100 patients who were scheduled for elective surgery to the lower limb and fulfilled the following criteria: American Society of Anesthesiologists physical status I or II; age between 13 and 16 yr (adolescent group, n = 40) or between 25 and 74 yr (adult group, n = 60); height between 155 and 180 cm; and body mass index between 18 and 32 kg/cm^2. Patients in each group were then randomly divided into two equal subgroups to receive spinal anesthesia with 0.5% tetracaine in either 7.5% or 0.75% glucose with 0.125% phenylephrine at the L3-4 interspace. With patients in the supine horizontal position, neural block was assessed in a double-blinded manner by cold, pinprick, and touch sensation, and a modified Bromage scale after the injection of the study drug. Data were analyzed using one-way ANOVA, the Student-Newman-Keuls test, the Kruskal-Wallis test, the Mann-Whitney test with the Bonferroni correction, and Chi-square analysis with the Bonferroni correction, where appropriate. $P<0.05$ was considered significant.

Results: Except for age, patient characteristics did not differ among the four study groups. The 7.5% glucose solution produced significantly higher spread of blockade in adolescents than in adults. In contrast, there were no differences in the levels of three sensory modalities between the two age groups after the 0.75% solution. The maximum decrease in systolic blood pressure was significantly smaller after the 0.75% glucose solution than after the 7.5% glucose solution in adolescents.

Conclusions: The present study showed that adolescents developed a higher level of blockade than adults after spinal anesthesia with 0.5% tetracaine in 7.5% glucose but not after the 0.75% glucose solution. These results indicate that adolescents develop an unexpectedly extensive level of blockade more easily than adults after intrathecal hyperbaric tetracaine but that the risk may be reduced by using a less heavy solution.

	Adolescent 7.5% G (n=20)	Adolescent 0.75% G (n=20)	Adult 7.5% G (n=30)	Adult 0.75% G (n=30)
Baricity	1.031±0.001	1.004±0.001#	1.031±0.001	1.003±0.001#
Block height (touch)	T4 (T7, T2)*	T11 (L1, T6) #	T8 (T11, T5)	T12 (L1, T4)
Block height (pinprick)	T3 (T6, T2)*	T10 (T12, T6) #	T6 (T10, T4)	T8 (T11, T4)
Block height (cold)	T3 (T5, T2)*	T8 (T11, T3) #	T5 (T7, T2)	T8 (T12, T2)*
Maximum ±SAP (%)	18.8±10.2	3.3±10.7#	16.1±12.5	10.4±13.9

Values are mean±SD, or median (10th, 90th percentiles).
*$P<0.05$ vs adult 7.5% G group. #$P<0.05$ vs 7.5% glucose group.

1. Br J Anaesth 74:41-45, 1995