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Incidence of transient neurological symptoms after spinal anesthesia with a 27 G Quincke needle at King Chulalongkorn Memorial Hospital

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Background : *The incidence of Transient Neurological Symptoms (TNS) after spinal anesthesia in King Chulalongkorn Memorial Hospital with a 25 G Quincke needle was 2.3%. With the 27 G Quincke needle becoming increasingly popular, we decided to reevaluate the incidence of TNS and other complications after spinal anesthesia with use of a 27 G Quincke needle.*

Methods : *This was a cross sectional descriptive study of every patient who underwent spinal anesthesia with 27 G Quincke needle during the study period. Each patient was examined daily for three days for complications. Statistical analysis was performed by chi-square test and multiple logistic regression with a significant level at p less than 0.05.*

Results : *During the four month period, 1,767 patients were studied. TNS was reported to be 2.9 % (51/1767). The incidence of PDPH, backache, and difficult urination were 0.3 % (6/1767), 8 % (141/1767), and 0.9 % (16/1767) respectively. The most common symptom was dull leg pain, which usually lasted 1-3 days. PDPH was mild and abated within 1-2 days with supportive treatment.*

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Conclusion : *TNS was an infrequent and recoverable complication after use of a 27 G Quincke needle. The data identified patients with associated diseases were important risk factors. Other factors such as age, gender, weight, local anesthetic agents, use of morphine, adrenaline, position, and type of operations failed to affect risk. PDPH was only 0.3%.*

Key words : *Transient neurological symptom, Spinal anesthesia, 27 guage, Quincke needle.*

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นุชจิรา ศรีวาจนะ, เทวารักษ์ วีระวัฒกานนท์, เฉลิมชัย สิรวัฒนากุล, สุชาติ กิจการเจริญสิน, สุทธิสินี ประเสริฐศรี. อาการทางระบบประสาทภายหลัง spinal anesthesia ด้วยเข็ม Quincke เบอร์ 27 ในโรงพยาบาลจุฬาลงกรณ์. จุฬาลงกรณ์เวชสาร 2543 มิ.ย; 44(6): 413 - 21

ที่มาและเหตุผล : *Transient Neurological Symptoms (TNS) เป็นภาวะแทรกซ้อนหนึ่ง ซึ่งสามารถพบได้ภายหลังจากการได้รับการฉีดยาชาเฉพาะที่เข้าช่องไขสันหลัง (spinal anesthesia) โดยในโรงพยาบาลจุฬาลงกรณ์ ได้เคยมีการศึกษาถึงการเกิด TNS จากการฉีดยาชาเฉพาะที่เข้าช่องไขสันหลังด้วยเข็ม Quincke ขนาด 25 G พบว่ามีอุบัติการณ์ 2.3 % แต่ในปัจจุบัน ได้เริ่มมีการนำเข็ม Quincke ขนาด 27 G มาใช้กันอย่างแพร่หลาย ดังนั้นจึงได้ทำการศึกษานี้ขึ้น เพื่อศึกษาถึงอุบัติการณ์ของ TNS และภาวะแทรกซ้อนอื่น ๆ ภายหลังจากการได้รับการฉีดยาชาเฉพาะที่เข้าช่องไขสันหลังด้วยเข็ม Quincke ขนาด 27 G*

วิธีการ : *ทำการศึกษาเชิงพรรณนา ณ จุดใดจุดหนึ่ง (cross - sectional descriptive study) ในผู้ป่วยทุกคนที่เข้ารับการผ่าตัดโดยได้รับการฉีดยาชาเฉพาะที่เข้าช่องไขสันหลังด้วยเข็ม Quincke ขนาด 27 G ในช่วงเวลานั้น ติดตามผู้ป่วยทุกรายหลังการผ่าตัดทุกวันเป็นเวลา 3 วัน เพื่อค้นหาภาวะแทรกซ้อนที่เกิดขึ้น ใช้สถิติ Chi- square test และ multiple logistic regression analysis ช่วยในการวิเคราะห์ผล โดยใช้ระดับนัยสำคัญทางสถิติที่ $P < 0.05$*

ผลการศึกษา : *ในระยะเวลา 4 เดือนที่ทำการศึกษามีผู้ป่วยได้รับการฉีดยาชาเฉพาะที่เข้าช่องไขสันหลังด้วยเข็ม Quincke ขนาด 27 G ทั้งสิ้น 1,767 คน พบอุบัติการณ์ของ TNS เป็น 2.9 % (51/1,767) ส่วนภาวะแทรกซ้อนอื่น ๆ พบอาการ Postdural Spinal Headache (PDPH) 0.3 % (6 /1,767) อาการปวดหลัง 8% (141/1,767) อาการปัสสาวะลำบาก 0.9 % (16/ 1,767) ลักษณะอาการของ TNS ที่พบมากที่สุด คือ อาการปวดขาแบบตื้อ ๆ ซึ่งอาการนี้สามารถดีขึ้นและหายได้เองภายใน 1-3 วัน ส่วนอาการ PDPH ที่เกิดขึ้นนั้นเป็นแบบไม่รุนแรงสามารถดีขึ้นและหายได้ด้วยการรักษาแบบประคับประคองภายใน 1-2 วัน*

สรุปผล : *การเกิด TNS จากการใช้เข็ม Quincke ขนาด 27 G พบได้ไม่บ่อยนักอาการสามารถดีขึ้นและหายได้เองพบว่าผู้ป่วยที่มีโรคประจำตัวอยู่ก่อนเป็นปัจจัยสำคัญที่เพิ่มความเสี่ยงต่อการเกิด TNS ส่วนปัจจัยอื่น ๆ ได้แก่ อายุ เพศ น้ำหนัก ชนิดของยาชา การผสม morphine หรือ adrenaline ในยาชา ท่าที่ใช้ในการผ่าตัด และชนิดของการผ่าตัด ไม่พบว่าเพิ่มความเสี่ยง นอกจากนี้ยังพบอุบัติการณ์ของ PDPH เพียง 0.3 %*

Spinal anesthesia is a special anesthetic technique with many benefits such as early recovery, good pain control, low cost and none of the complications associated with general anesthesia. We had studied the complications after spinal anesthesia with use of a 25 G Quincke and found 2.3% TNS, 0.9% PDPH, 9% back pain and 0.4% difficulty in urination.[1] Spinal anesthesia with a 27 G Quincke was rising in popularity as its ease of insertion and effectiveness were not different from the 25 G needle. There was common expectation that the small needle would have less complications. Therefore we tried to prove this by study the incidence of TNS and other complications after spinal anesthesia with a 27 G Quincke at King Chulalongkorn Memorial Hospital.[2-6]

Method

All patients who underwent any operation with spinal anesthesia with 27 G Quincke needle at King Chulalongkorn Memorial Hospital during the study period were included. All patients received the usual spinal anesthesia without any intervention. The medication was selected by each anesthesiologist according to the type of operation and status of the individual patient.

All patients were followed up daily for three days to find the complications. All possible problems such as leg pain, leg weakness or numbness, headache, back pain, blurred vision, difficult urination, etc. were asked. The questionnaire about the patient's sense of well being and satisfaction with the spinal anesthesia for a future operation was also given on the first post-operative day. Patients who developed TNS and other complications were assessed, treated and followed up.

Statistics

Quantity data was expressed as the mean with standard deviation, and quality data was expressed as percent of cases.The statistical significance of the difference between values was assessed by the student test and the chi-square test. Multiple logistic regression analysis was used to clarify independent factors that influenced the occurrence of TNS. The probability value of $p < 0.05$ was considered significant.

Results

There were 1,767 cases included in the study during the four month period. The patients consisted of 1,275 females (72.2 %) and 492 males (27.8 %). Their ages ranged from 12 to 89 years (36.61 ± 14.77 years), and weights from 34 to 113 kg. (62.15 ± 10.48 kg) (Table 1). The number of patients who did not encounter any complications throughout the study was 1,553 (87.9%). There were 51 patients (2.9%) who complained of minor TNS such as leg pain, leg numbness and leg weakness. Other complications like PDPH, back pain, and difficult urination were found in 6 patients (0.3%), 141 patients (8%), and 16 patients (0.9%), respectively (Fig. 1). The characters of the TNS were dull, sharp, burning leg pains and 92% of the patients recovered within 3 days (Fig.2, 3). There were two cases who recovered after 10 and 20 days. The patients who had preoperative underlying disease had a significantly higher incidence of TNS ($P < 0.05$) but no definite disease with a special relation could be identified (Table 2). Other factors such as age, gender, weight, local anesthetic agents, addition of morphine or adrenaline, position and type of operation were not significant risk factors for TNS (Table 1, 3 - 4

and Fig. 4 - 6).

There were 87.1% of the patients who were satisfied with the spinal anesthesia and would accept it for another operation in the future. Nearly all of the patients (97.5 %) felt well in the first post-operative day. The satisfaction with the spinal anesthesia decreased to 72.5% of the patients in the TNS group and 86.3% of the patients in this group had a sense of well being on the first post-operative day in spite of some degree of neurological symptoms. However the occurrence of TNS decreased satisfaction and the sense of well-being significantly ($p < 0.05$) (Table 5).

Table 1. Demographic data of the patients and TNS group.

Group	Total cases (%)	TNS cases (%)
Sex : Female	1275 (72.2)	34 (0.26)
Male	492 (27.8)	17 (3.45)
Age (year)	36.61 ± 14.77	39.33 ± 17.11
Weight (kg)	62.15 ± 10.48	61.88 ± 10.50

Table 2. Pre - operative evaluation*

	Total cases (%)	TNS cases (%)
Healthy	1414 (80.0)	35 (2.47)
Associated disease (DM, HT, etc)	353 (20.0)	16 (4.53)

*$p < 0.05$

Table 3. Agents used for spinal anesthesia.

Agents	Total cases (%)	TNS cases (%)
5 % heavy lidocaine	277 (15.7)	10 (3.61)
5 % heavy lidocaine with adrenaline	756 (42.8)	24 (3.17)
5 % heavy lidocaine with adrenaline with morphine	25 (1.4)	1 (4.00)
0.5 % heavy bupivacaine	465 (26.3)	13 (2.79)
0.5 % heavy bupivacaine with morphine	237 (13.4)	3 (1.26)
0.5 % isobaric bupivacaine	5 (0.3)	0
0.5 % isobaric bupivacaine with morphine	2 (0.1)	0

Table 4. Positions of the patients.

Positions	Total cases (%)	TNS cases (%)
Supine	1544 (87.4)	39 (2.52)
Prone	9 (0.5)	0
Lithotomy	158 (8.9)	10 (6.32)
Lateral	14 (0.8)	1 (7.14)
Jack's knife	42 (2.4)	1 (2.38)

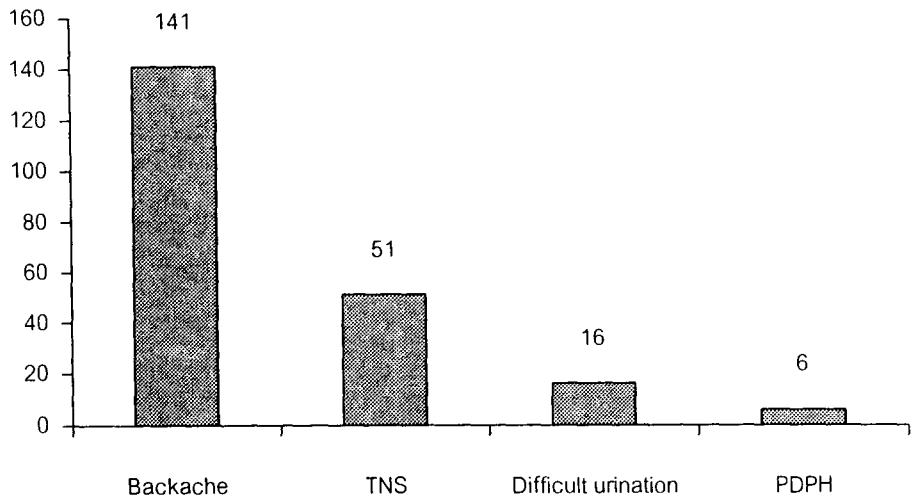

Figure 1. Incidence of complication after spinal anesthesia.

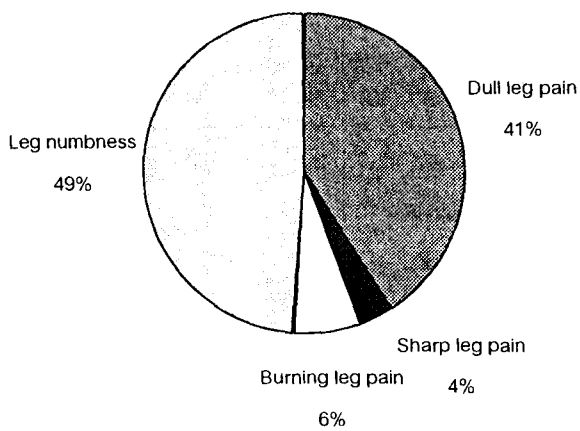

Figure 2. Character of TNS.

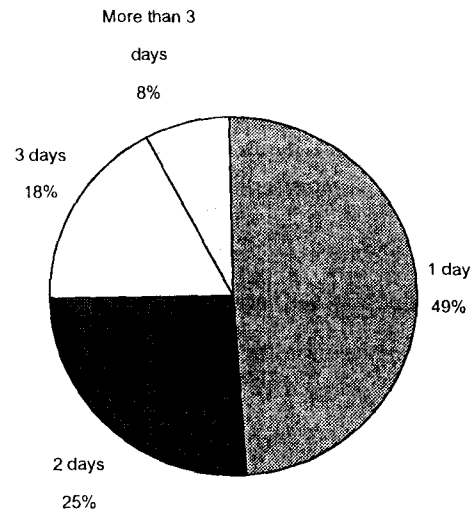

Figure 3. Duration of TNS.

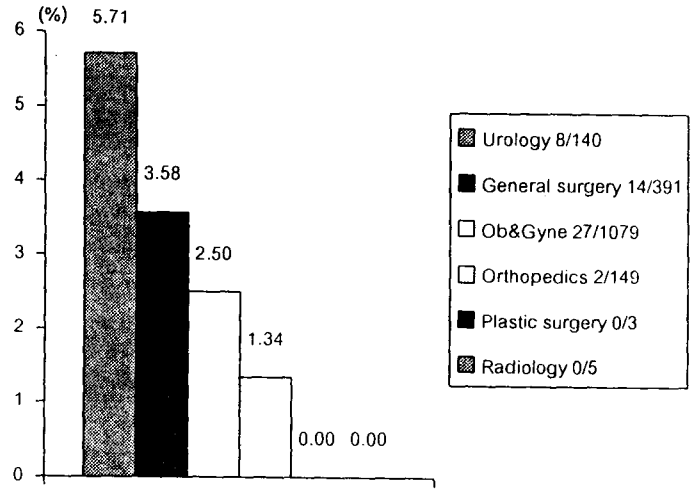

Figure 4. Incidence of TNS by type of operations.

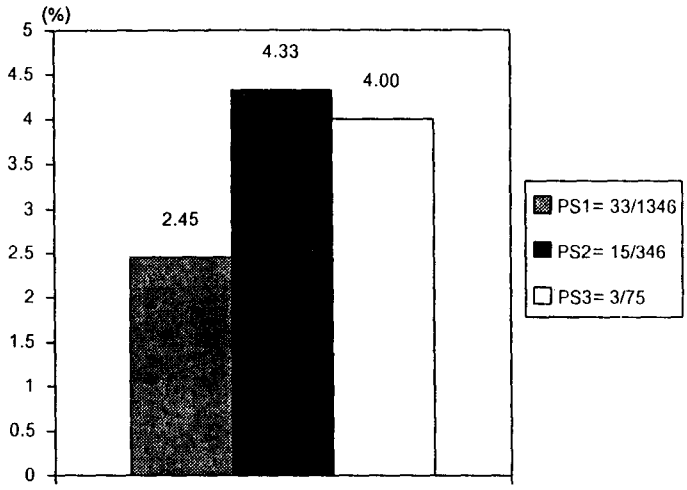

Figure 5. Incidence of TNS by physical status of the patients.

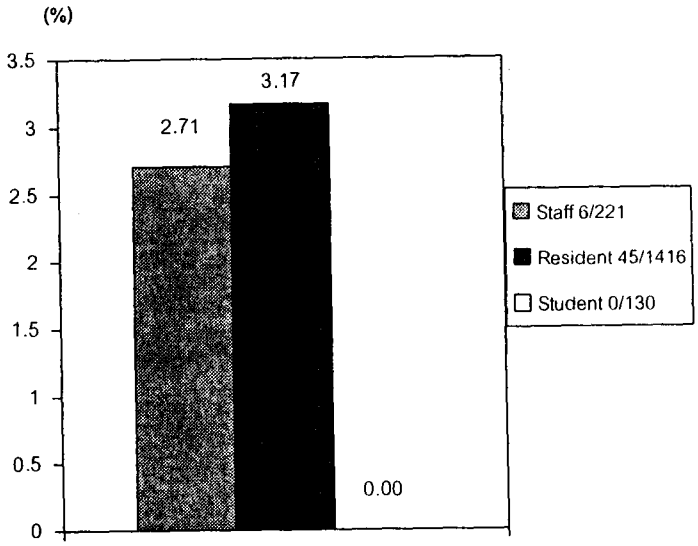

Figure 6. Incidence of TNS by anesthesiologist status.

Table 5. Response of the patients to questionnaire about satisfaction in spinal anesthesia and sense of well being in the first post - operative day.

Response	Total cases (%)	TNS cases (%)
Satisfied	1539 (87.1)	37 (2.40)
Unsatisfied	220 (12.5)	14 (6.36)*
Well – being	1722 (97.5)	44 (2.55)
Not well – being	45 (2.5)	7 (15.55)*

*$p < 0.05$

Discussion

Quincke needle 27 G was increasing popularity for spinal anesthesia. This resulted from a belief that the smaller needle would decrease the incidence and severity of complications. When compared with our previous study with 25G needle spinal anesthesia,[1] the complication rate was in accordance with this study. However, our present study was not designed to directly compare complications after spinal anesthesia with different sizes of spinal needles. The incidence of TNS after spinal anesthesia with a 27 G Quincke needle was 2.9% while in the previous study with a 25 G Quincke needle it was 2.3%.[1]

The incidence of TNS after use of a 27 G Quincke needle has been found to range from 1.3% to 22%.[7-12] Our report was in the lower end of this range. Freedman, et al,[7] found TNS in 1.3% of patients who received bupivacaine and in 12% after receiving lidocaine. This raises problems blamed on local anesthetic agents. Salmela et al,[12] reported that lidocaine and the lithotomy position were risk factors for TNS, and TNS was found in 20% of the lidocaine group. So lidocaine came into a jeopardy status. Our study did not support certain risk factors for TNS. These include age, gender, weight, type of operation, local anesthetic agents (lidocaine or bupivacaine), addition of morphine or adrenaline, position and anesthesiologists. We only found that patients who had underlying disease were at high risk for TNS but we could not identify particular diseases due to the small number of patients having each disease.

All of the neurologic symptoms were self-limited. Most of the patients recovered within 2 days after operation without sequelae. Most of the patients in the TNS group still felt well even with these symptoms, and they were satisfied with spinal anesthesia and accepted it for future operations. However, the number was significantly different from the patients who did not have TNS.

In the study, we found only 0.3% PDPH after use of a 27 G Quincke needle, compared to 0.9% after use of a 25 G Quincke needle in a previous study at King Chulalongkorn Memorial Hospital.[1] PDPH was a delayed complication, and recovery was within 1-2 days with supportive treatment. Back pain and difficult urination happened 8% and 0.9% respectively. All of these complications were mild and fully disappeared within 1-2 days.

Conclusions

Spinal anesthesia is a safe anesthetic technique. A few non-serious complications could be found and the incidence of TNS was 2.9 %. TNS was self – limited and required careful follow up until recovery. Thus we continue to advocate spinal anesthesia in all appropriate conditions. Justification for use of lidocaine still requires more evidence from reliable, randomized, double- blind controlled trials with large sample sizes because of the small incidence of complications especially TNS.

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