



Simple and less cost but not effective

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Lumbar puncture procedures, which are not only indicated for diagnosis but also needed for anesthesia or analgesia (either spinal anesthesia or continuous epidural anesthesia), are frequently performed in routine clinical practice.¹⁻³ One of the most common complications after procedures is post-dural puncture headache (PDPH), which usually develops within 5 days after lumbar puncture.^{1,4-7} Despite international guidelines, lumbar puncture procedures vary from setting to setting based on individual's traditions and experience.¹ Similarly, care of the post-lumbar punctures also varied greatly. However, much concern of long-term psychological and physical outcome after PDPH has been raised. Orbach-Zinger et al. found women with PDPH had an increased incidence of postpartum depression (52% vs 11%; 95% confidence interval of the difference [CI-D], 32-50), posttraumatic stress disorders (13% vs 0.4%; 95% CI-D, 8-20), chronic headache (33% vs 15%; 95% CI-D, 9-27), and backache (44% vs 21%; 95% CI-D, 14-34), and decreased breastfeeding following a PDPH (55% vs 77%, 95% CI-D, 33-55) than women without did, emphasizing the need for postpartum follow-up for women with PDPH.⁸ Therefore, there are many strategies attempting to offering effective prevention methods to decrease the incidence and/or occurrence (3.5%-33%) of patients after lumbar puncture based on identification of risks.⁴

Cognat et al. proposed some controversial questions, possible answers and recent evidence rating for the above-mentioned issue and all focused on the prevention of PDPH occurrence.⁴ The authors found the following risk factors associated with an increased risk of occurrence of PDPH, including (1) a higher incidence of PDPH can be found in the certain population, such as newborns and children as well as younger age group; (2) some tools or instruments applied to lumbar puncture are associated with an increased risk of PDPH, such as the use of traumatic needles; (3) and the modification of procedures during

the lumbar puncture is related to an increased risk of PDPH, including the use of seated position in place of lateral during lumbar puncture as well as the application of lumbar puncture at the lower levels of intervertebral spaces.⁴ Moreover, although experience supposed that some of the prevention strategies can reduce the risk of occurrence of PDPH, evidence showed these strategies seem to be of no use.⁴ The followings are examples. Some reported that patients with underlying diseases or medications may be a high-risk population for PDPH, or many others may contribute to the PDPH occurrence, including the procedure of ease or difficulty to be performed, the amount of cerebrospinal fluid volume for use, the use of aspiration method to obtain cerebrospinal fluid, or the adding conventional postoperative strategies, such as rest after lumbar puncture, the administration of fluid supplementation, or the use of caffeine; however, it is interesting to find none of them have adequate evidence to support their effectiveness.⁴

Therefore, in the July issue of the *Journal of the Chinese Medical Association*, Miss Tai and her colleagues conducted a prospective cohort study to test whether ambulation instead of resting supine after lumbar puncture was related to increased risk of PDPH.⁹ As expected, the authors further support Dr. Cognat's finding that rest after lumbar puncture for reducing the occurrence of PDPH is deficient of any evidence, although it is widely accepted prolonged decubitus after lumbar puncture is a key step in reducing the incidence of PDPH.⁴ The authors found that there was no statistically significant difference of the incidence of PDPH between the non-bed-rest group and bed-rest group (5.9% vs 18.4%, $P = 0.078$); therefore, the authors concluded that bed rest cannot reduce the risk of PDPH and by contrast, may lead to a marginally increased risk of PDPH.⁹ The current study is interesting.

In fact, Cochrane review in 2016 has tested the effectiveness of the routine bed rest on the reduction of PDPH, since it is a long-term belief that reducing PDPH can be done by prolonged decubitus (rest).¹⁰ A total of 24 trials with 2996 subjects were enrolled for analysis and the results showed an absence of benefits with bed rest compared with immediate mobilization on the incidence of severe PDPH (risk ratio [RR] 0.98; 95% confidence interval [CI], 0.68-1.41) and on the incidence of any PDPH (RR 1.16; 95% CI, 1.02-1.32).¹⁰ Furthermore, bed rest may probably increase the incidence of PDPH (RR 1.24; 95% CI, 1.04-1.48) compared with immediate mobilization.¹⁰ Finally, Cochrane review questioned the benefit of routine bed rest after lumbar puncture, since there was no evidence suggesting that the above-mentioned procedure is beneficial for the prevention

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Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

Journal of Chinese Medical Association. (2021) 84: 901-902.

Received July 30, 2021; accepted July 30, 2021.

doi: 10.1097/JCMA.0000000000000596.

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of PDPH onset.¹⁰ Therefore, the results or conclusion of the current study by Miss Tai are in agreement with recent evidence. However, some of their findings and procedures are worthy of further discussion.

As shown by authors, atraumatic needle was not available in the current study, contributing to the uncertainty of their conclusion applicable to other settings,⁹ such as the use of atraumatic needle in place of traumatic needle in the current study. We are wondering why the authors conducted the current study without the use of atraumatic needles for lumbar puncture since the evidence is so strong that the use of atraumatic needles has dramatically and significantly reduced any PDPH onset and reduce the severity of PDPH if the incidence of PDPH cannot be totally erased.^{11–14} The critique has existed for two decades: why are neurologists so reluctant to adopt atraumatic needles?^{12,13} Drs. van de Beek and Brouwer have emphasized that we need to change practice, and we should phase out conventional needles and start using atraumatic needles for lumbar puncture and reduce harm to our patients.¹¹ To date, physicians have not embraced the use of atraumatic needles in clinical practice, as shown in the current study⁹ and we are also wondering why it is so difficult to overcome this innovation deadlock? Dr. Zavis and colleagues proposed the following reasons: (1) physicians are in a lack of awareness of the morbidity associated with PDPH; (2) physicians were not convinced by scientific evidence in favor of atraumatic needles (boundaries between clinical communities as barriers to change); (3) they perceived the atraumatic needle to be technically difficult (differences in medical practice and training as barriers to change); or (4) they were concerned about the higher costs (financial pressures) of atraumatic needles (austerity and multi-professionalism in public healthcare as barriers to change).^{12,13} In fact, in routine clinical practice, similar barriers have existed everywhere¹⁵ and it is not surprising to find even one of the biggest or top hospitals in Taiwan also fails to achieve.

Nath et al. performed a systematic review and meta-analysis to compare patient outcomes after lumbar puncture with atraumatic needles and conventional needles, and the study enrolled 110 trials and 31,412 subjects. The results showed the incidence of PDPH was significantly reduced in the atraumatic group compared to the conventional needle group (4.2%, 95% CI, 3.3–5.2 vs 11.0%, 95% CI, 9.1–13.3) with RR 0.40 (95% CI, 0.34–0.47).¹⁴ Atraumatic needles were also associated with significant reductions in the need for intravenous fluid or controlled analgesia (RR 0.44; 95% CI, 0.29–0.64), need for epidural blood patch (RR 0.50; 95% CI, 0.33–0.75), any headache (RR 0.50; 95% CI, 0.43–0.57), mild headache (RR 0.52; 95% CI, 0.38–0.70), severe headache (RR 0.41; 95% CI, 0.28–0.59), nerve root irritation (RR 0.71; 95% CI, 0.54–0.92), and hearing disturbance (RR 0.25; 95% CI, 0.11–0.60).¹⁴ The most important thing that some of the barriers to change has been clearly clarified since this systematic review and meta-analysis has shown that success of lumbar puncture on the first attempt, failure rate, mean number of attempts, and the incidence of traumatic tap and backache did not differ significantly between the atraumatic and conventional needle groups.¹⁴ Moreover, pre-specified subgroup analyses of PDPH revealed no interactions between needle type and patient age, sex, use of prophylactic

intravenous fluid, needle gauge, patient position, indication for lumbar puncture, bed rest after puncture, or clinician specialty,¹⁴ suggesting that if the physicians used the atraumatic needles to conduct the similar study in the future, the targeted questions (to investigate the bed rest on the reduction of PDPH) may be no longer present.

ACKNOWLEDGMENTS

This article was supported by grants from the Taiwan Ministry of Science and Technology, Executive Yuan, Taiwan (MOST 109-2314-B-075B-014-MY2 and MOST 110-2314-B-075-016-MY3), and Taipei Veterans General Hospital (V110C-082, and VGH109E-005-5). The authors appreciate the support from Female Cancer Foundation, Taipei, Taiwan.

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