

Investigation and Analysis of the Current Situation of Intrathecal Labor Analgesia and Childbirth in Jinan City

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Abstract: *Objective:* To understand the current status of intraspinal labor analgesia and childbirth in medical institutions in Jinan, and to promote the implementation of labor analgesia. *Methods:* The expert group of the Jinan Labor Analgesia Quality Control Center conducted quality inspections and childbirth surveys on labor analgesia in more than 20 hospitals across the city in 2019, 2021, and 2023. The inspections were conducted through hospital briefings, data reviews, and on-site visits, collecting data on the number of obstetric beds, monthly delivery volumes, natural birth rates, and rates of intraspinal anesthesia for labor analgesia in each hospital, and providing on-site feedback on inspection findings and recommendations for improvement. *Results:* Among the 24 public hospitals surveyed, there were 6 tertiary general hospitals, 15 secondary general hospitals, and 3 tertiary maternal and child health hospitals. Data collected from the survey: From January to July 2019, the total number of deliveries in the 24 hospitals was 36,101 cases, with an overall implementation rate of intraspinal labor analgesia of 16.5%, a pain relief rate of 51%, and maternal satisfaction of 50%. From January to August 2021, the total number of deliveries in the 24 public hospitals was 27,846 cases, with an overall rate of intraspinal labor analgesia of 34.0%, a pain relief rate of 82%, and maternal satisfaction of 79%. From January to October 2023, the total number of deliveries in 23 hospitals was 26,979 cases, with an overall rate of intraspinal labor analgesia of 55.9%, a pain relief rate of 100%, and maternal satisfaction of 98%. *Conclusion:* From 2019 to 2023, the rate of intraspinal labor analgesia in hospitals in Jinan significantly increased, and the effectiveness of labor analgesia significantly improved, but the total number of deliveries significantly decreased.

Keywords: Labor analgesia; Current situation of childbirth; Jinan city; Analgesic efficacy

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1. Introduction

In 2018, the National Health Commission launched a pilot program for labor analgesia ^[1,2] to promote and

standardize intraspinal labor analgesia. To implement national, provincial, and municipal guidelines and requirements regarding labor analgesia, and to comprehensively grasp the current status of childbirth and the implementation and quality of intraspinal labor analgesia in medical institutions across Jinan, the Jinan Labor Analgesia Quality Control Center conducted quality inspections and childbirth surveys on labor analgesia in more than 20 hospitals across the city. From 2019 to 2025, at meetings of the Jinan Labor Analgesia Quality Control Center, the Jinan Labor Analgesia Academic Annual Conference, and the Annual Conference of the Jinan Integrated Traditional Chinese and Western Medicine Midwifery Committee, relevant professional experts were invited to conduct training and lectures on issues related to labor analgesia. The expert group of the Labor Analgesia Quality Control Center conducted three research and supervision visits on intraspinal labor analgesia across the city in 2019, 2021, and 2023. The author of this article, as a member of the expert group, participated fully in the process, and all data were extracted by the author from the Labor Analgesia Quality Control Center. The findings from the three research and supervision visits are summarized as follows.

2. Materials and methods

2.1. Data sources

The first labor analgesia survey was conducted from July to August 2019, visiting a total of 24 public hospitals in Jinan City, districts, and counties that provide midwifery services, including 6 tertiary general hospitals, 15 secondary general hospitals, and 3 tertiary maternal and child health hospitals. The second labor analgesia supervision and inspection were conducted in September 2021, examining the same 24 public hospitals visited in 2019. The third labor analgesia quality control inspection was conducted from November to December 2023, investigating a total of 23 public hospitals in Jinan City, districts, and counties, as one public hospital had canceled its obstetrics department due to a very low number of deliveries. This study has been reviewed and approved by the Ethics Committee of Jinan Fifth People's Hospital, with the ethics review number 22-5-01.

2.2. Survey methods

The Jinan Labor Analgesia Professional Medical Quality Control Center organized centralized inspections by experts. The expert group consisted of specialists in anesthesiology, obstetrics, and midwifery. The inspections were conducted through hospital briefings, data reviews, and on-site visits, with on-site feedback provided on inspection findings and recommendations for improvement.

2.3. Inspection content

Data were collected on the number of obstetric beds, monthly delivery volumes, natural birth rates, rates of intraspinal anesthesia for labor analgesia, effectiveness of labor analgesia, and maternal satisfaction in each hospital. The effectiveness of labor analgesia, i.e., the pain relief rate during childbirth, refers to the proportion of parturients with a pain score of ≤ 3 one hour after analgesia implementation out of all sampled parturients. The use of facilities for intraspinal anesthesia for labor analgesia, including venues, equipment, consumables, and medications, was examined. The qualifications of personnel, work norms, charging practices, and relevant policy support for intraspinal labor analgesia in hospitals were inspected. The subjective and objective factors influencing the implementation of intraspinal labor analgesia were

summarized and analyzed.

3. Results

Data collected from the survey: From January to July 2019, the total number of deliveries in the 24 hospitals was 36,101 cases, with an average monthly delivery volume of 5,157 cases, a natural birth rate of 53.1%, and an overall implementation rate of intraspinal labor analgesia of 16.5% (see **Table 1**). Except for three pilot hospitals for labor analgesia, the labor analgesia rates in other medical institutions were all below 20%, with five hospitals having a “0” implementation rate. The pain relief rate was 51%, and maternal satisfaction was 50% (see **Table 2**). From January to August 2021, the total number of deliveries in the 24 public hospitals was 27,846 cases, with an average monthly delivery volume of 3,481 cases, a natural birth rate of 55.1%, and an overall rate of intraspinal labor analgesia of 34.0% (see **Table 1**). The pain relief rate was 82%, and maternal satisfaction was 79% (see **Table 2**). Eleven hospitals had an intraspinal labor analgesia rate of over 40%, with three hospitals exceeding 60%. From January to October 2023, the total number of deliveries in the 23 hospitals was 26,979 cases, with an average monthly delivery volume of 2,698 cases, a natural birth rate of 51.2%, and an overall rate of intraspinal labor analgesia of 55.9% (see **Table 1**). The pain relief rate was 100%, and maternal satisfaction was 98% (see **Table 2**). Eleven general hospitals had an intraspinal labor analgesia rate exceeding 55%, while the maternal and child health hospitals at the city and district levels had an intraspinal labor analgesia rate exceeding 85%. By analyzing the data obtained from the three surveys, we found that from 2019 to 2023, the number of deliveries in Jinan significantly decreased, the rate of intraspinal labor analgesia significantly increased, and the natural birth rate remained largely unchanged (see **Figure 1**). Both the pain relief rate and maternal satisfaction significantly increased.

Table 1. Labor analgesia and childbirth in Jinan

Year	Average monthly number of childbirths (cases)	Rate of natural childbirth (%)	Rate of labor analgesia (%)
2019	5157	53.1	16.5
2021	3481	55.1	34.0
2023	2698	51.2	55.9

Table 2. Efficacy of labor analgesia and maternal satisfaction in Jinan

Year	Parturients (n)	Analgesic effect/pain relief rate (%)	Maternal satisfaction rate (%)
2019	200	51	50
2021	200	82	79
2023	200	100	98

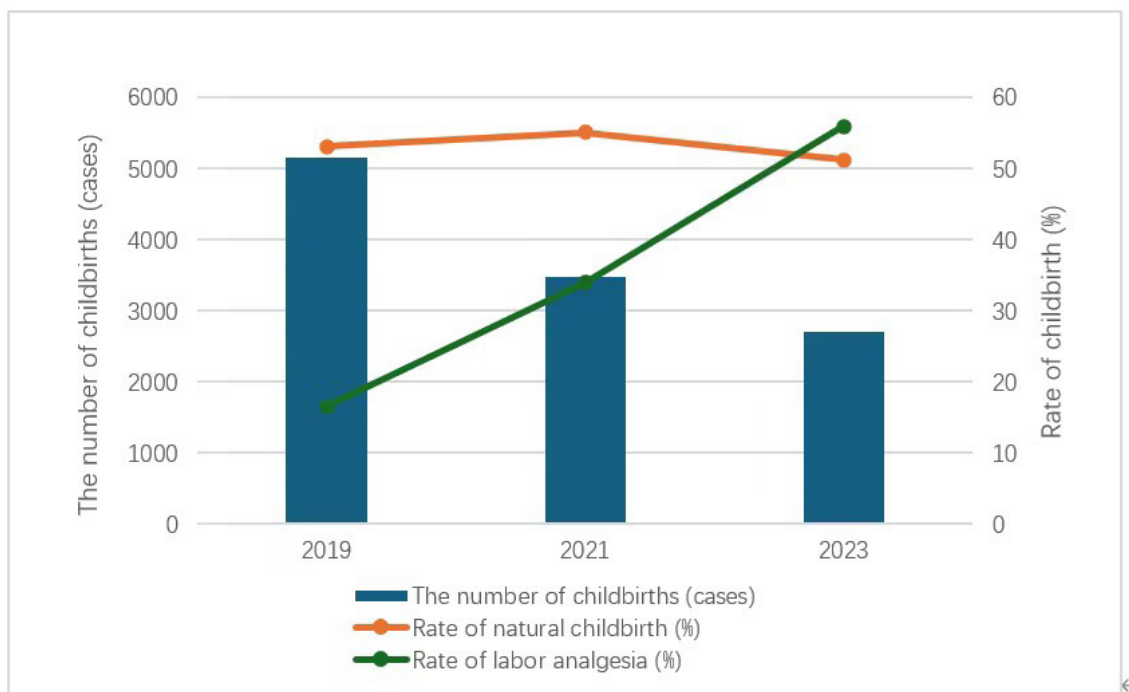


Figure 1. Labor analgesia and childbirth conditions in Jinan City.

4. Discussion

To alleviate labor pain in parturients and reduce the cesarean section rate, the “Happy Maternity Ward, Comfortable Childbirth” initiative launched by Professor Yao Shanglong and the “National Promotion Project for Comfortable Childbirth Analgesia” initiated by Professor Xu Mingjun in 2016, with support from the National Health Commission, promoted neuraxial labor analgesia across all provinces in China. This led to a significant increase in the rate of labor analgesia, greatly benefiting parturients. Since 2018, the National Health Commission has issued several documents^[3, 4] encouraging the promotion of neuraxial labor analgesia, designating 912 hospitals as the first batch of pilot hospitals for labor analgesia. Through the leading role of these pilot hospitals and the regulatory role of local health commissions, the popularization and application of neuraxial labor analgesia techniques have been advanced. In 2021, the charge for labor analgesia in our city was filed with the medical insurance bureau as a self-paid item. The establishment of a separate charge item reflects the technical and labor value of medical personnel, enhancing their work enthusiasm. Given the shortage of anesthesiologists, hospitals have implemented incentive measures to encourage anesthesiologists to provide analgesia services through overtime work. With the joint efforts of the Jinan Health Commission, hospitals, and medical workers, the rate of labor analgesia has significantly increased, its implementation has become more standardized, facilities and equipment have become more comprehensive, and the analgesic effect has improved. Labor analgesia services have been fully rolled out in our city, with the labor analgesia rate exceeding the 40% quality control indicator set by the National Health Care Reform Center’s goal of “increasing the application rate of neuraxial labor analgesia in patients undergoing vaginal delivery”. Furthermore, the target of “achieving a 50% labor analgesia rate” proposed

by the Shandong Provincial Health Commission in the Notice on Further Enhancing Comprehensive Pain Service Capabilities on November 15, 2023, has been realized ^[5].

The increase in the rate of neuraxial labor analgesia can be attributed to several factors: the gradual maturation of neuraxial labor analgesia techniques, with a significant improvement in effectiveness, which not only alleviates labor pain in parturients but also promotes natural vaginal delivery, ensures maternal and infant safety, and accelerates postpartum recovery in parturients ^[6-8]. Increased publicity efforts, with hospitals conducting outreach activities in communities through events such as “Anesthesia Day”, “International Midwives’ Day”, and “World Health Day”, in addition to publicity efforts in maternity schools, enabling parturients to learn about, understand, and ultimately choose labor analgesia promptly; the growing recognition and trust in labor analgesia among parturients and their families, with the new concept of “happy childbirth” gradually replacing the old notion that “childbirth must be painful”; the inclusion of labor analgesia charges in medical insurance in some provinces and regions, alleviating the financial burden on parturients; increased attention from hospitals, with leaders recognizing the importance of labor analgesia through inspections and research by labor analgesia quality control centers, leading to improved staffing, material support, and policy backing for labor analgesia, as well as relevant incentive policies for anesthesiologists, obstetricians, and midwives in delivery rooms, and an increase in the number of anesthesiologists to support the implementation and development of neuraxial labor analgesia ^[9-11]. However, the clinical utilization rate of labor analgesia in China still lags behind that of Western countries, where the labor analgesia rate can reach 85% ^[12]. According to this survey, the labor analgesia rate in maternity hospitals in our city can reach 85%, but it is relatively low in general hospitals. Traditional beliefs among parturients and their families, a shortage of medical personnel, inaccurate timing of labor analgesia by midwives, and insufficient attention from hospitals to labor analgesia work are the main reasons for the current low rate of labor analgesia ^[13].

The survey results indicate a significant decline in the number of deliveries in Jinan hospitals from 2019 to 2023, which can be attributed to several factors: with social development and improved education levels, young people are delaying their age of first marriage and first childbirth, with late marriage and childbirth becoming increasingly common; modern individuals have higher aspirations for quality of life and place greater emphasis on personal development and enjoying life; the outbreak of the pandemic has postponed people’s childbirth plans, leading to a decrease in the number of deliveries; the pandemic’s impact on the global economy has affected employment and income for many, increasing life stress and reducing the desire for childbirth ^[14].

From 2023 to 2025, various provinces and cities have introduced corresponding childbirth incentive measures ^[15,16,17], and the state has issued the Implementation Plan for the Childcare Subsidy System. In 2023, the CPC Jinan Municipal Committee and the Jinan Municipal Government issued the Implementation Plan for Optimizing Childbirth Policies to Promote Long-term Balanced Population Development in Jinan, which stipulates that for families in the city’s household registration system with second and third children born after January 1, 2023, in accordance with childbirth policies, a childcare subsidy of 600 yuan per child will be provided monthly until the child reaches the age of 3 ^[18]. In 2024, the Jinan Medical Security Bureau issued the Regulations on Maternity Insurance Benefits for Employees, providing maternity allowances to in-service employees. On January 18, 2025, the 13th Session of the Standing Committee of the 14th Shandong Provincial People’s Congress reviewed and approved the Decision of the Standing Committee of the Shandong Provincial People’s Congress on Amending the Regulations on Population and Family

Planning in Shandong Province, extending marriage leave to a maximum of 18 days, implementing tax preferential policies such as special additional deductions for individual income tax for infant care and children's education, and including appropriate labor analgesia and assisted reproductive technology items in the scope of medical insurance reimbursement. Population issues are closely linked to national development. To encourage childbearing women to have children actively, better collaboration is needed among the government, enterprises, institutions, and communities to introduce more detailed measures to alleviate families' concerns, such as government policies providing rewards or tax exemptions to units for hiring female workers, encouraging units to employ female workers, establishing unit or community childcare services, extending maternity leave, providing parental leave for both parents, and advocating through public opinion the benefits of childbearing at an appropriate age for women's physical and mental health, guiding families to eliminate childbirth anxiety, and effectively enhancing women's willingness to have children, thereby alleviating families' concerns.

As an important component of comfortable medical care, neuraxial labor analgesia significantly alleviates labor pain in parturients, promotes natural childbirth, and ensures maternal and infant safety and health. Due to its proven effectiveness, its utilization rate is increasing, while the use of other methods of labor analgesia is decreasing^[19]. There is still room for improvement in the development of labor analgesia. A small number of parturients have contraindications to neuraxial anesthesia or harbor concerns about invasive procedures, making them unable or unwilling to undergo neuraxial labor analgesia. Research by Wang Jianpeng et al. indicates that acupuncture anesthesia for labor analgesia is effective, with few complications and high safety. For parturients with contraindications to neuraxial anesthesia or those unwilling to undergo invasive procedures, acupuncture anesthesia or intravenous anesthesia, as well as other non-pharmacological labor analgesia methods, such as psychological support techniques, free positioning, the Lamaze breathing method, doula instruments, massage, music therapy, aquapuncture analgesia, and laboring in water, can be considered^[20,21].

5. Conclusion

In summary, from 2019 to 2023, the rate of neuraxial labor analgesia in Jinan hospitals has significantly increased, and the effectiveness of labor analgesia has markedly improved, although the total number of deliveries has significantly declined. This survey investigated the current status of childbirth and the implementation of neuraxial labor analgesia in medical institutions across Jinan, further standardizing the treatment process and charges for labor analgesia and enhancing the safety and quality of labor analgesia medical care. We hope that with the efforts of the government, hospitals, and society as a whole, the quality of labor analgesia will continue to improve, its utilization rate will keep increasing, and more parturients will truly benefit, enjoying "happy childbirth".

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