

When East Meets West: History of Obstetric Anesthesia

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Abstract

The practice of obstetric anesthesia in both the eastern and western parts of the world has evolved through time. The development of obstetric anesthesia in western medicine has been credited to Sir James Simpson in 1847 with the use of ether in childbirth. Ancient and traditional practice and the influence of the west contributed to the modern-day labor analgesia in the east. Methods of labor analgesia have changed to enhance the labor experience of parturients - from a wide array of herbs and opiates to dural puncture neuraxial technique. This manuscript aims to put in perspective the history of obstetric anesthesia in both the western and eastern medicine, and how each has contributed to the other.

Keywords: Obstetrics; History; Neuraxial anesthesia; Labor analgesia

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Introduction

"Take a deep breath, hold, and push..."

This paints a picture of a woman just about ready to bring a new life into the world. Yet such a wonderful childbirth experience can bring one memories of pain, fear, and joy all packaged into one. Childbirth is an experience that is both exciting and painful for every woman. This is a review of the development of obstetric anesthesia and puts in perspective the history of obstetric anesthesia in both the western and eastern medicine, and how each has contributed to the other.

Methods and Design

In western medicine, the introduction of modern anesthesia in obstetrical practice has been credited to Sir James Y. Simpson who used ether in childbirth on January 19th of 1847. A few more attempts led him to chloroform which was found to be stronger and better than ether [1]. By the turn of the 20th century, ether and chloroform were ubiquitous in childbirth on both sides of the Atlantic Ocean [2]. Despite this medical breakthrough, however, the British criticized that ether and chloroform not only increased the risk of hemorrhage and infection but had detrimental effects on the newborn [3]. Some would argue that the pain of childbirth was inseparable from the function of the uterus, and to suppress that pain would inhibit labor [4]. Still, others would argue that to relieve pain during childbirth was to counter the biblical teaching that women would suffer in childbirth after Eve's sin and that anesthesia would open the door to unnecessary procedures without the patient's consent [4]. **Figure 1** shows a timeline on the development of obstetric anesthesia in the western part of the globe.

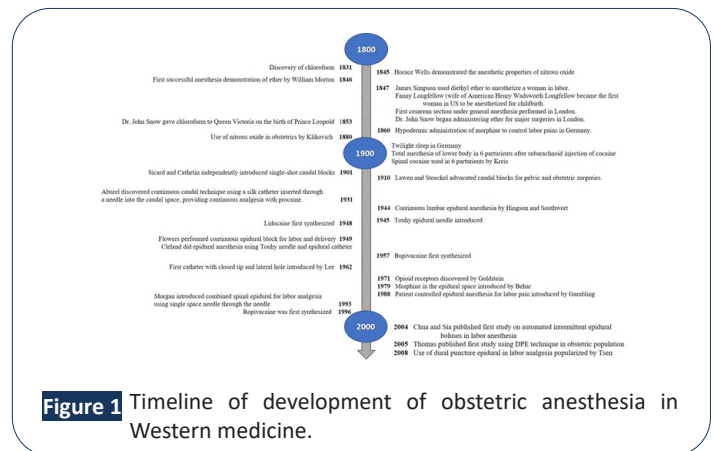


Figure 1 Timeline of development of obstetric anesthesia in Western medicine.

Eastern medicine dates back to as early as the 3rd century BCE. Countries like China, Japan, Philippines, and India have pain-relieving drugs as evidenced by their extensive botanical resources and writings dating back to the ancient times. However, despite this wealth of knowledge, anesthesia has not flourished as much to this day without western medicine influx to these countries.

Medicine in China is of great antiquity that relies in the dualistic cosmic theory of yin and yang. Anesthesiology, however, was brought to imperial China only when it opened its doors for trade and evangelism. Dr. Rev. Peter Parker introduced ether anesthesia into China a year after it had been publicly demonstrated in Boston and then subsequently used chloroform anesthesia after it was introduced by Simpson. After this momentous occasion, medical education commenced in China with the establishment of its first medical school. Pre-world war II anesthesiology in China kept pace with its American and European counterparts. Subsequent anesthetics introduced in the US were reviewed

pharmacologically in China and the Chinese manufactured their own anesthesia machine in the 1930s [5,6]. The nongovernmental No Pain Labor and Delivery (NPLD) was launched in 2008 with the goal of improving labor outcomes in China by increasing the absolute labor epidural analgesia rate by 10% by establishing 10 training centers over a 10-year period. It also involves 24/7 obstetric anesthesia coverage in Chinese hospitals through education and modeling multidisciplinary approaches [7]. Despite this undertaking, the rate of cesarean delivery in 2010 escalated to greater than 8.2 million deliveries annually, with at least 12% were maternal request, mostly due to fear of labor pains or analgesia failure [7]. In 2011, the Chinese Society of Anesthesiology (CSA) established the obstetric anesthesia committee, involving many experts to set up standards, guidelines and consensus and designate training sites in mainland China [8].

In 1804, Dr. Hanaoka introduced anesthesia in early Japan 40 years before Morton's use of ether anesthesia. He synthesized the drug, Tsusensan, consisting of 6 medicinal herbs, with *Datura alba* (Mandarage) as its main component. This Mandarage will be known later to contain scopolamine. Labor analgesia was attempted as early as in the Meiji period (1868-1912) with the use of pantopon, an opioid with less respiratory depression than morphine. Inhalational anesthesia using chloroform was administered for cesarean delivery up to 1897 [9]. It was not until postwar; however, that evolution of anesthesiology in Japan progressed rapidly when doctors from the United States came to Japan in 1950 to help reform Japanese medical science with the subsequent establishment of the Japanese Society for Anesthesia [9].

The richness of Indian culture combined with religion and traditions have impacted their practice of medicine and healing that led to the modern era. India boasts of significant contributions to the development of anesthesia, dating from the pre-ether era describing surgery using opium, wine, and Indian hemp in 500 BCE. The first administration of ether anesthesia in India was in 1847 in Calcutta, just five months after demonstration of ether anesthesia in Boston. Chloroform was first administered in India in 1848, barely 3 months after it was first used by Simpson [10]. Despite these advancements, culturally speaking, intense pains are thought to be necessary to ensure a speedy delivery, thus no remedies for reducing labor discomfort is given. Women are considered shameless if they make noises audible to people outside the room. The laboring woman's silence is considered very important in other parts of South Asia as well [11]. A cross-sectional study conducted in a tertiary care hospital in South India in 2017 among 100 parturient showed that only 14% of pregnant women were aware of labor analgesia. Majority of the subjects would opt for a safe and effective labor pain relief but its proportion has dropped to 55% when mentioned that costs go up to 30% to 40% [12]. In other study involving 1000 full-term pregnant women in rural India, only 33% had knowledge about labor analgesia. When given full information about labor analgesia options, the main reason of refusal among 69% of these patients dated back from childhood, when they were taught that they have to undergo labor pains, and that it is mandatory to endure the pain of childbirth. Socioeconomic status, lack of teaching, low

level of practical exposure, and prevailing confusion/ignorance about labor analgesia benefits as well as education status all seem to be the biggest hurdles toward acceptance of pain relief during childbirth [13].

During the precolonial period folklore medicine practices were the cornerstone of medicine in the Philippines. Traditional ways of healing include rituals and herbs with a Babaylan, a female healing leader. From among the traditional healers came the hilot which means "massager" or a "folk midwife" and the modern day Traditional Birth Attendants (TBA) [14]. Despite having extensive herbal medicines as documented in various writings by Spanish friars, it was not until the beginning of the nineteenth century which marked the end of the Galleon trade in 1820s and the opening of the Suez Canal that has paved the way to western medicine [15]. Towards the end of the 19th century, the American colonization of the Philippines played an enormous role not only in the country's government but also in the healthcare system. This includes restructuring hospitals to include a surgical ward and operating rooms. The surgical department was started, and American nurse anesthetists assisted by Filipino nurses administered anesthesia [16]. It is not until Dr. Quintin Gomez, who will later on be named the father of anesthesia in the Philippines, had formal anesthesia residency training in Chicago and came back to the Philippines to establish anesthesia training for doctors. From then on, anesthesia as a separate specialty blossomed.

In Philippine culture, labor analgesia is oftentimes pre-determined. Physician practices are influenced by their knowledge of a certain technique whether it is intravenous opioids or regional anesthesia. Most of the time, Filipino parturients try to toughen it out until later in the course, until pain is unbearable. Unique to the obstetric practice in the Philippines is the use of episiotomy, necessitating local anesthetic infiltration. When the decision for a cesarean section has been reached due to fetal or maternal distress, the anesthesiologist would be called immediately, and spinal anesthesia is the method of choice. Some patients opt to do the Lamaze method, a psycho-prophylactic method that is based on increasing a mother's confidence in childbirth through classes teaching different ways to cope with pain using relaxation and breathing techniques, movement and massage.

Opinions and practices definitely vary from one health care worker to the next. Factors such as religion, economic status, knowledge, fears, and previous experiences all play a role in the patient's and practitioner's decision for labor analgesia. A study of obstetricians in one of the largest tertiary hospitals in Manila, Philippines has shown that in 2003, among deliveries in the charity service, only 35% were given some form of analgesia. 86% to 90% of parturients in the private hospitals, on the other hand, has received some form of analgesia [17].

Labor analgesia in modern times has evolved. Neuraxial analgesia has been, to date, the most effective method of pain relief during childbirth in contemporary clinical practice [18]. However, neuraxial analgesia techniques are not limited to just standard epidural and Continuous Spinal-Epidural (CSE) blocks. While the debate has been ongoing as to which neuraxial

technique is superior to the other, a novel approach called Dural Puncture Epidural (DPE) has recently gained popularity after the cornerstone study that compared standard epidural and CSE with DPE for labor analgesia.

Introduced in 1996 by Suzuki and colleagues in patients undergoing lower abdominal surgery, DPE involves identifying the epidural space, creating a dural puncture using a spinal needle, withdrawing the spinal needle and the epidural catheter inserted. DPE provides rapid onset of sacral analgesia along with bilateral caudal spread in the obstetric population [19]. The mechanism is that the conduit created by the dural puncture provides translocation of medications from the epidural space to the subarachnoid space. This technique provides better hemodynamic stability, improved epidural catheter function, and lower incidence of asymmetric block with fewer maternal and fetal side effects [19]. **Table 1** shows a summary of the maternal and fetal/neonatal effects.

Table 1: Maternal and Fetal/Neonatal Effects of DPE.

| Maternal | Fetal/Neonatal |
|---|--|
| less hypotension | no fetal bradycardia |
| less pruritus | median Apgar scores 8-9 |
| no post-dural puncture headache | less frequent Apgar scores <7 at 1 min and 5 min |
| backache, neck ache, persistent postpartum paresthesia same incidence with epidural | |
| rate of cesarean delivery same with epidural/CSE | |
| less uterine hypertonus | |
| less uterine tachysystole | |

Conclusion

It goes without saying that one's own labor experience is truly different from another. Over the years, obstetric analgesia and anesthesia continues to evolve, and each woman is entitled to her own experiences of labor. Most of all, analgesic and anesthetic options will continue to be a woman's decision, coupled with accurate data and knowledge for pain relief that an anesthesiologist will be able to offer.

Delivery of the infant into the arms of a conscious and pain-free mother is one of the most exciting and rewarding moments in medicine (Donald D. Moir).

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