Remote video lecture education improves anesthesiology residency training in Tibet of China

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To the Editor: The Qinghai-Tibet Plateau, called the roof of the world, is an extremely harsh environment with scarce medical resources. After the founding of the People’s Republic of China, the Chinese government has invested a lot of financial support to develop Tibet Autonomous Region and to improve the quality of healthcare. The life expectancy of the whole district has increased from 36 years old in the 1950s to 68 years old currently, and the population has grown from less than 1 million in the 1950s to 3.31 million today.

Despite such a considerable achievement, the healthcare level of Tibet Autonomous Region is still facing some problems. According to the report “Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected sub-national locations: a systematic analysis from the Global Burden of Disease Study 2016” published in the Lancet, striking sub-national disparities emerged in personal healthcare access and quality. China has particularly large gaps between locations with the highest and lowest scores in 2016, performance ranged from 91.5 (89.1–93.6) in Beijing to 48.0 (43.4–53.2) in Tibet (a 43.5-point difference).

Therefore, the Chinese government continues to increase medical investment in Tibet and insists on regularly dispatching medical experts to train local medical practitioners. As the top one hospital in China, Peking Union Medical College Hospital (PUMCH) has continuously dispatched experts to Tibet Autonomous Region People’s Hospital (TARPH) since 2015. We found that due to the limited resources of local medical colleges in Tibet Autonomous Region, anesthesiologists have difficulty in obtaining the standardized lectures of medical knowledge or textbooks, as therefore hinders improvements in the medical knowledge level of Tibetan doctors.

To improve the anesthesiology residency training in TARPH, eight chapters were selected from anesthesiology textbook “Miller’s Anesthesia” for remote video education. These chapters include: anesthesia machine, opioids, respiratory monitoring, airway management, nerve block, obstetric anesthesia, neuro-anesthesia, and acute post-operative pain. Eight senior anesthesiologists from the anesthesiology department of PUMCH were arranged to interpret the corresponding chapters intensively through a 40-min video lecture including knowledge combined with clinical practice.

The study was reviewed and approved by the Institutional Review Boards of PUMCH (No. S-K881). Data were collected from ten anesthesia residents in TARPH from March 2018 to September 2018. All the anesthesia residents learned these eight lectures and finished tests before and after the video. The baseline knowledge level was tested on the day before the lecture. A follow-up test was raised on the day after the lecture. Twenty (ten for the pre-lecture and ten for the post-lecture) 5-option multiple-choice questions were prepared for each lecture. After completion of all eight video lecturing within 6 months, the baseline scores (shown as the pre-lecture scores) and the scores after the video lectures (shown as the post-lecture scores) were summarized and displayed as the mean ± standard deviations. A histogram was used to check the normality of the data. Paired t tests were used to compare the pre- and post-lecture scores [Table 1]. Through statistical comparison, significantly increased post-lecture scores were achieved in 87.5% video lectures.

Video lecture is an appropriate choice for anesthesiology resident education in remote areas or underdeveloped
regions. Firstly, Tibet is a sparsely populated area, with 4000 m altitude above the sea, low air pressure and inconvenient transportation. Video lecture can overcome all above time and space barriers. Secondly, remote synchronous teaching has been successfully applied to medical education,[5] the video lectures and massive open online courses produced and provided by PUMCH anesthesiology department are already absolutely accessible and free for all, which ensures such feasibility. Last but not the least, through remote video lectures, the TARPH anesthesiology residents were directly taught by the senior anesthesiologists from the top level hospital of China, thus an equal education level can also be achieved. Although the prepared video lectures can be watched repeatedly at any time, a characteristic that promotes student learning, establishing a nationwide simultaneous live broadcast is necessary despite the cost of the network and hardware.

In summary, as the first attempt to investigate anesthesiology education in the Qinghai-Tibet Plateau and the transmission of anesthesia knowledge by video lectures to trainees in TARPH, video lectures are useful to improve the anesthesiology residency training in Tibet Autonomous Region of China.

Acknowledgements

The authors acknowledge Qi Li, the Education Department of PUMCH for his valuable work on the video production. A special acknowledgement should be shown to the teachers giving the lectures. Finally, the authors wish to extend their thanks to the residents who studied hard for the patients’ benefits.

Funding

This study was supported by the grants from the Tibet Natural Science Funding Committee Grant (No. XZ2017ZR-ZYZ06), the Chinese Academy of Medical Sciences Innovation Fund for Medical Sciences (CIFMS) (No. 2016-I2M-3-024), and the Peking Union Medical College Hospital Faculty Development Overseas Training Program (No. 2018PUMCHFD0-LX).

Conflicts of interest

None.

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How to cite this article: Li X, Labaciren, Zhang YL, Shen L, Huang YG. Remote video lecture education improves anesthesiology residency training in Tibet of China. Chin Med J 2020;133:245–246. doi: 10.1097/CM9.0000000000006065

Table 1: Comparison of the pre- and post-lecture scores.

| Items                  | Pre-lecture score (n = 10) | Post-lecture score (n = 10) | P     |
|------------------------|-----------------------------|-----------------------------|-------|
| Anesthesia machine     | 5.60 ± 1.84                 | 7.20 ± 1.40                 | 0.05  |
| Opioids                | 3.40 ± 1.35                 | 7.60 ± 1.26                 | <0.05 |
| Respiratory monitoring | 4.20 ± 1.99                 | 6.20 ± 1.14                 | <0.05 |
| Airway management      | 6.20 ± 1.14                 | 8.60 ± 1.40                 | >0.05 |
| Nerve block            | 6.80 ± 1.69                 | 6.80 ± 1.14                 | <0.05 |
| Obstetric anesthesia   | 3.40 ± 1.90                 | 7.60 ± 1.58                 | <0.05 |
| Neuro-anesthesia       | 5.00 ± 1.05                 | 8.00 ± 1.33                 | <0.05 |
| Acute post-operative pain | 5.00 ± 1.41                | 9.00 ± 1.05                 | <0.05 |
| Average                | 4.95 ± 0.47                 | 7.60 ± 0.53                 | <0.05 |