Indian healthcare sector needs more robots

Medical schools in India produce the largest number of doctors than anywhere else in the world, corresponding to the rapid proliferation of medical colleges in the last two decades, especially within the private sector[1]. WHO has reported that by 2015, 36% of the medical manpower is going to be produced by India. Over the last few years there has been increasing interest and activities in medical education reflecting the underlying needs and desire to improve. The enthusiasm and momentum generated among the medical educators need to be sustained and supported to bring about meaningful reforms in medical education. Expenses incurred by the Indian government on healthcare are the highest amongst developing countries. India's expense on healthcare sector comprises 5.25% of the GDP. The introduction of practical surgical robotic devices has opened a new perspective on minimal access surgery in all surgical endeavours. In recent years, robot-assisted surgeries have become the preferred approach in developed countries such as the United States[2] and the United Kingdom, have attracted considerable attention in many other parts of the world. There are about 1171 da Vinci surgical systems installed worldwide, including 863 in the United States and 211 in Europe[3]. By handling control of surgical instruments through robots and positioning surgeons at comfortable console with 3D or high resolution display at up to 20 times magnification, surgery of vital organs can be accomplished with precision and accuracy, minimizing damage to tissues or loss of blood. Robotic wrists provide much more freedom of movement and articulated motion inside the abdominal cavity. Computer interfacing allows for remote control surgery, for precise manipulations by downscaling the surgeon's motions. Surgeons around the world are using sophisticated robots to perform surgical procedures. The da Vinci surgical system was released in April 1997 and received FDA approval in 2000 for laparoscopic surgeries. Robotic technology provides fundamental advantages to the operating surgeon, particularly for those who are trained in laparoscopy. The acquisition of robots in India has been started by government initiative with two installations at the All India Institute of Medical Sciences, New Delhi, but is yet to enter the mainstream. Robotic technology will definitely grow and encompass a huge range of surgical procedures, particularly in urology. India should not ignore the robotic revolution and should wholeheartedly imbibe the future generation of technological expertise. After all India claims that it will soon be a 'superpower'. With this tag comes much expectation and responsibility[4]. Robotic surgery has come to stay and will make slow but steady inroads into Indian healthcare delivery system. In USA, there are 17,000 urologists for 300 million people; in Brazil, 4000 urologists for 200 million people and in China, 12,000 urologists for 1.3 billion people. However, in India only 2500 urologists for 1 billion people. There is an increased work load on urologists in India. Comparison of the number of urologists versus robotic facilities in different countries in Asia clearly shows India is lagging behind.

There is also an advantage in surgical learning curve with the robots over open or laparoscopic surgeries. If we take the case to proficiency in radical prostatectomy training we need to do 100 cases to be proficient in open surgery and 50 cases to be proficient in conventional laparoscopy. However, for robot-assisted laparoscopy 12 cases are needed to be proficient. In the United States 80% of all cases done were robots assisted, and less than 2% were performed laparoscopically. In Bangalore there are about 120 urologists; among them only 3–5 urologists do an advanced laparoscopy. To attract medical tourism as well as improve healthcare delivery and improve teaching, Indian healthcare industry needs more robots. Based on outcomes from recent published series (multiple institutions) one must not forget that more and more indications are successfully treated with robotics, not only in urology but also in other disciplines. Robotic surgery is an evolution of traditional laparoscopy with a special tool offering the surgeon more mobile instruments and better vision. With increased experience, more and more indications will be performed robotically, with significant benefit for our patients. Because of the advantages (significantly less pain, less blood loss, fewer complications, less scarring, a shorter hospital stay and a faster return to normal daily activities), robotics is here to stay. The present principal drawback remains the cost (a daVinci Robot costs Rs 8 crores). Health is a human right, which has also been accepted in the Constitution. Its accessibility and affordability has to be insured. According to the recent reports, the health sector in India has become a Rs 25,000 crore industry. With the entry of various private insurance companies now the customers have choice of buying this insurance from 24 insurance companies. Indian can afford this technology restricted access for many patients. To improve healthcare delivery system to promote medical tourism and medical education, India should invest on robots.

Table 1. Number of urologists and robotic facilities in different countries in Asia

Country	Number of urologists	Population	Number of robotic facilities in the country
Hong Kong	100	7 million	5 robots
South Korea	1500	50 million	26 robots
India	2500	More than 1 billion people	5 robots

Source: P. Rao's presentation at Urological Society of India (USI) Conference, Agra, 2010.

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