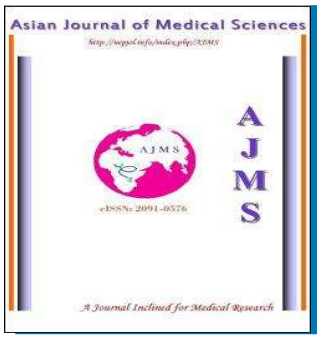

APPLICATION OF ROBOTICS TECHNOLOGY IN CLINICAL PRACTICE IN INDIA.

ORIGINAL ARTICLE,Vol-5 No.1

Asian Journal of Medical Science, Volume-5(2014) http://nepjol.info/index.php/AJMS

[1]Karandikar Pratibha M. , [2]Tayade Motilal C. [1]Mechanical Engineering Department, Pravara Rural Engineering College , Loni , Maharashtra, India , 413736. [2]Department of Physiology, RMC, Pravara Institute of Medical Sciences (PIMS), Loni, Maharashtra, India, 413736.

CORRESPONDENCE:

Karandikar Pratibha M.
Mechanical Engineering Department,
Pravara Rural Engineering College,
Loni, Maharashtra,
India, 413736.
Email:
pmkarandikar04@gmail.com
Phone: +919604102508

"Survey concerned with actual application of Robotics technology in clinical practice in India"

ABSTRACT

Background: The field of mechanical engineering in association with electronics and computer science concerned with developing robotic devices that can move and react to sensory input. However the implementations and application of robotics in clinical practice was really a question? We planned to study the assessment of awareness, will and work level of medical robotics from medical professionals in clinical practice in India.

Study Design: We used self prepared model questioner containing information related to applications, awareness, will etc. of medical professionals for application of medical robotics in clinical practice. The questioner was approved by IJBAMR Forum, Pune, India. The data was collected during June 2012 to January 2013. Such 220 questionnaires were filled and analyzed.

Observations and Results: Only 1.36 % professionals observed with professional training. It was also observed that, only 54.54% professionals were known about current aspects about robotics application & knowledge regarding training centers.

Conclusion: It is promising fact found in study that 88.63% professionals were very excited and willful for the application of robotics in their practice in future. From our study, it is concluded that there is noted a huge lake of awareness regarding application of medical robotics technology in Indian medical professionals.

Keywords: Robotics, Medical education.

INTRODUCTION

The field of mechanical engineering in association with electronics and computer science concerned with developing robotic devices that can move and react to sensory input. Robotics is one of newer branch dealing with artificial intelligence and its applications in day to day life. Robots are nowadays are widely used in various industries to deal high-risk jobs such as welding, cutting and riveting etc. They are also used in special conditions that would be harmful for humans like in cleaning toxic wastes or defusing bombs etc. Although great advances and changes have been made in field of robotics in worldwide during the last decade, Robots are still not in process of applications in everyday life concerning in developing countries like India.

Vast changes have been made by technology development in medical field in India in last decade. However the implementations and application of robotics in clinical practice was really a question? Even awareness and will for application of such knowledge by medical professionals is a question today? Are government policies as well medical education pattern is responsible for that? With these queries in mind, we planned to study the assessment of awareness, will and work level of medical robotics from medical professionals in clinical practice in India.

MATERIALS AND METHODS

We used self prepared model questioner (Proforma:1) containing information related to applications, awareness, will etc. of medical professionals for application of medical robotics in clinical practice. The questioner was approved by IJBAMR Forum, Pune, India. IJBAMR Forum is a voluntary forum assessing and helping quality research in Medical stream. The participants were included, those voluntarily agreed. However the participants were excluded, those voluntarily not agreed due to their personal reasons. The written consent was obtained. The data was collected during June 2012 to January 2013.

The questioner was discussed and carefully filled by the various medical specialty professionals working in different hospitals from urban as well as rural area. (Table: 1)

The data was randomly collected. We tried to cover majority of departments concerning with possibilities of application of medical robotics in their field. (Table: 1) Such 220 questionnaires were filled and analyzed.

RESULTS

In present study, we found most of the medical professionals from specialty are untrained as well as unaware regarding use and application of robotics in their area. Only 1.36 % professionals observed with professional training. It was also observed that, only 54.54% professionals were known about current aspects about robotics application & knowledge regarding training centers. However actual applications of Robotics in clinical practice were found only 1.36 % practioners involved in such surgical practices. It is promising fact found in study that 88.63% professionals were very excited and willful for the application of robotics in their practice in future.

DISCUSSION

Proper selection of technologies for patient care is a big challenge for medical professionals from developing world. Availability, training and cost factor plays an important role in such conditions in maintaining the high quality of functions. Robotics is one part of technology that have been seen a vast growth in such management.[1] Association of Robotic technology and minimally invasive surgery approaches is on the way towards progressing. Application of robotics is the revolutionizing medical field both inside and outside operating rooms. The field of surgery has not seen such innovation since the first laparoscopic cholecystectomy procedure was performed in 1985 (Reynolds, 2001). [2]

Robotics is used to enhance the performance of physicians during minimally invasive procedures (Taylor, Lavallee, Burdea, &Mosges, 1996).[3] The number of procedures performed each year with robotic assistance is growing, as well as the number of surgical specialties using robotics (Chandra & Frank, 2003).[4]

Potential applications for nanorobotics in medicine include diagnosis and targeted drug delivery for cancer, biomedical instrumentation, surgery, pharmacokinetics, monitoring of diabetes, and very useful.[5]

Extensive development and growth of Information technology has made vast changes in recent years in medical education system in India at both the teaching level as well as research level.[6] Currently the healthcare

Proforma: 1) Questioner Data sheet:

S.No. **Date:**

Name of Hospital: …… Address:
……..

Incharge (Name & Designation): ……

Department / Unit: …….. Area of specialty:
…….

Name of incharge/Head/ Faculty: …… Signature:

Questionary:

1. **Are you aware regarding application of Robotics in Clinical practice: Y/N**
2. **If Yes, source of information: ……**
3. **Are you willing for application of Robotics in your field /area of practice: Y/N**
4. **Are you aware regarding advantages of application of Robotics in clinical practice: Y/N**
5. **If Yes, kindly mention it briefly: ……**
   ……
6. **How many articles/Books have been referred by you? ……**
7. **Do you know which centers /institutions provide such training in India? : Y/N**
8. **If Yes, source of information: ……..**
9. **Do you know which centers /institutions provide such training in abroad? : Y/N**
10. **If Yes, source of information: ……**

Remark of contributor:

Signature of Doctor: **Signature of contributor: ……..**

Name of Doctor: …… **Name of contributor: ……..**

Table No: 1 List of Hospitals:

S.No.	Area / Hospital	Number of participants (n = 220)
1	Sasoon General Hospital ,Pune	23
2	Private Practioners from Pune city	92
3	Private Practioners from Nashik City	97
4	Private Practioners from Ahmednager district from rural area.	08

Table No 2. Data Analysis

S.No.	Analysis	(n= 220)	Percentage (%)
1	Awareness regarding application of Robotics in clinical practice	107	48.63
2	Willingness regarding application of Robotics in clinical practice	195	88.63
3	Information regarding training centers	120	54.54
4	Actual applications of Robotics in clinical practice	3	1.36

industry is considered the best career choice for young people worldwide including India.[7] In our present study, it was found that majority of medical professionals from specialty are untrained as well as unaware regarding use and application of robotics in their area. Only 1.36 % professionals were observed with professional training. It was also observed that, only 54.54 % professionals were known about current aspects about robotics applications & information about training centers.

CONCLUSION

From our study, it is concluded that there is noted a huge lake of awareness regarding application of medical robotics technology in Indian medical professionals. However it is a great ray of hope, the majority of professionals are willing to deal with robotics technology and are in planning to implement them in future**.**

Study limitations:

This is a small randomized sample study consisting of only 220 medical professional participants from three cities in Maharashtra from India of which not a single city included as metro city. For more accuracy, there should require a large sample data collection involving cities from different states from India.

Recommendations:

The government and medical education policy makers should pay attention towards the innovative newer technologies like medical robotics technology as a special field area of implementation in education as well as in training at postgraduate level or fellowship level.

Acknowledgement:

We are very thankful to IJBAMR forum, India for their approval and subsequent help in data collection. We are also very thankful to all participant doctors who voluntarily participated in this project in active discussion & doctor staff from Sasoon General Hospital , Pune , India.

REFERENCES

1. Backus D, Winchester P, Tefertiller C.Translating Research into Clinical Practice: Integrating Robotics into Neurorehabilitation for stroke survivors. Top Stroke Rehabil. 2010 Sep-Oct;17(5):362-370.
2. Walker Reynolds, The First Laparoscopic Cholecystectomy .JSLS. 2001 Jan-Mar; 5(1): 89–94.
3. Paula Francis, Howard N. Winfield, Medical Robotics. The Impact on Perioperative Nursing Practice, UrolNurs. 2006; 26(2):99-108.

4. Paula Francis, Winfield, Medical Robotics: The Impact on Perioperative Nursing Practice: Future Direction of Medical Robotics, Medscape news. Downloaded on 26 Dec.2011, http://www.medscape.com/viewarticle/531748_5
5. KeshavKumar,Vineshaggrawal, Future scope of Nanorobotics in Medical field in India. ,http://www.seminarprojects.com/Thread-future-scope-of-nanorobotics-in-medical-field-in-india#ixzz1hj65DfOH.
6. Dr. Motilal C. Tayade, Dr. Nandkumar .B.Kulkarni , The Interface of Technology and Medical Education in India: Current Trends and Scope , Indian Journal of Basic & Applied Medical Research; December 2011: Issue-1, Vol.-1, P. 8-12.
7. Dr Srinivas R.,Deshpande, Dr.Gayathree , Dr.Kashinath Shenoy,.Dr.Yathish T.R. The changing Profile of the Indian Medical Profession: The missing social service component. Indian Journal of Basic & Applied Medical Research; December 2011: Issue-1, Vol.-1, P. 56-65

Authors Contributions:
KPM: Basic concept, Data collection, References collection,
Paper writing, statistics
TM: Data collection, Paper writing

Conflict of Interest: None

Date of Submission: 27.4.2013
Date of Peer review: 7.6.2013
Date of submission of revised version: 17.6.2013
Date of peer review: 28.7.2013
Date of Acceptance: 29.7.2013
Date of Publication: 9.9.2013