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Original Article

A Survey-Based Feedback Analysis of the Current Medical Teaching Methodology and Trends in Medical Research Practice in a South Indian Medical Institute

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Abstract

Background: The spine of a good healthcare system is the medical education received by its doctors. The delivery of medical education is evolving continuously. This study was conducted among 541 students in a prestigious medical college in India. The aim of the study was to find out lapses in our current medical education system and steps to improve it. **Methods:** A total of 541 medical students were included in this study. All undergraduate medical students in second year or above were included in this study. A questionnaire of 20 questions was given to each student and they were asked to mark the answers they felt were most appropriate. The questionnaire dealt with issues faced in our current education system regarding teaching methodology, research, and steps to improve the healthcare system. Data was collected, analyzed and statistically evaluated using Microsoft Excel and SPSS version 21.0. **Results:** Most students felt that classroom strength should not be more than a hundred students. They felt that more innovative teaching methods and discussions should be included. Students laid emphasis on research and clinical skills training. They felt that the healthcare system also needs tweaking in terms of funding and practicing evidence-based medicine to be on par with healthcare systems across the world. **Conclusion:** The results of this study resonate with the results of various other studies regarding the delivery of medical education. It takes into account the holistic approach of improving medical education and healthcare rather than focusing on one single aspect.

Key Words: Clinical research; Survey analysis; Feedback; Medical education; Teaching; Education [Subheading] (Source: MeSH-NLM).

Introduction

Medical education and healthcare in India are facing serious challenges with regards to the content and standard of education. The Government of India recognizes health for all as a national goal and looks to produce competent physicians of first contact in trying to achieve this goal (Vision 2015 - Medical council of India. Available: www.mciindia.org/tools/announcement/MCI_booklet.pdf. Accessed on 14 Dec 2011). There is a serious concern in the current medical education system due to the lack of evidence-based teaching.[1] The Indian population not only requires more doctors but also a good quality of doctors. Focus on the quality of teaching in medical colleges has led to increased use of student services to evaluate the current teaching practices. There has been an evolving trend among professors to shift the focus on teaching from exam-oriented lectures towards clinical based discussions (Vision 2015 - Medical council of India. Available: www.mciindia.org/tools/announcement/MCI_booklet.pdf. Accessed on 14 Dec 2011). A number of teaching methods like power point presentations, animation videos, 3D models, activity-based learning etc. are being employed to appeal to students with different learning styles. However, the effectiveness of these methods cannot be confirmed without a student feedback in the form of student service.

Imparting medical knowledge and ensuring sound foundation in clinical skills and medical knowledge is the safest bet to produce good doctors. With the evolution in medicine, it is essential to evolve our teaching methods to impart medical knowledge to students. Various studies in different medical institutions across India and the world have been conducted to provide an insight as to what would be the ideal methodology according to students, to efficiently grasp the material and skills being taught to them.[1] These studies had analyzed population of less than 250-300 participants and also had ambiguous conclusions.

The objectives of this study were initiated after interaction with a few students from the second to house surgeons. These students expressed that a necessary change in the teaching system was warranted. The authors decided to test this hypothesis by conducting a survey-based feedback of all the undergraduate students. The aims of this study were to analyze the response of students towards a favorable teaching modality, to identify the influencing qualities of a teacher as perceived by the medical students, to understand the opinion of students with regards to the current status of health care services in our country, and to explore the interest of medical students towards research and its role in evidence-based medicine.

Methods

The survey-based study was carried out on Bachelor of Medicine and Bachelor of Surgery (MBBS) students of JSS medical college, Mysore, India. The participants included in this study were only medical students of second, third, fourth year MBBS and the house surgeons. All the students were aged between 18 to 23 years. None of them were suffering from any major medical or psychiatric illness.

A questionnaire was designed by the authors, which included 20 questions, the content of which included teaching methodology, aids for teaching, clinical research and its importance in health care. The students were assured about anonymity and confidentiality of their responses provided. A written informed consent was taken from all the students participating in the survey that the responses provided by them were for research and evaluation purpose only. The participants were only instructed to enter the details of their age, gender and current academic year of study. No names were collected to maintain anonymity. This would allow the students to provide honest responses and feedback. Although there could be a possibility for self-selection bias, all the students who matched the inclusion criteria in the

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respective batches were invited to participate in the study. The questionnaire was explained to them, and all were encouraged to mark the responses, they felt was appropriate. Exclusion criteria included: participants with history of psychiatric disorders or not in a position to provide reasonable responses, incomplete responses, and multiple contradictory answers marked for the same question were excluded from this study. In addition, first year students were excluded from the study for not having experienced clinical postings in the hospital. Participants who withdrew consent and did not wish to participate in the study were eliminated from the study.

Data collection: The questions were first self-applied to look for potential flaws or irrelevance to the study objectives. An initial pilot study was done by inviting five students from each batch to provide their response. The opinions of the students were considered before drafting the final questionnaire. One of the four senior authors explained to each participant the nature of the survey, the contents of the questionnaire and the objectives of our survey. Each student was provided with a separate hard copy of the questionnaire and was asked to mark the appropriate answers with pen. The instruction to each student was standardized which included the objectives of our study and elimination criteria were explained if their responses were incomplete. Students were also encouraged to write down their personal response or opinion about a question, if they did not find any of the options appropriate. Only students from second year MBBS to house surgeons were included. The authors felt that first-year students were still fresh to the course and they would be inexperienced to provide a constructive feedback. Also, they would not be exposed to clinical rotation postings in the hospital and hence, excluded from this study.

Data analysis: Data was collected and tabulated in Microsoft Excel. The statistics of this data was drawn using SPSS version 21.0.

Results

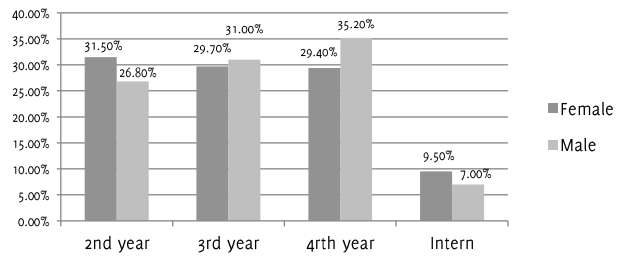
A total of 541 MBBS students who met the inclusion criteria were included in this study. Out of them, 213 (39.4%) were males and 327 (60.6%) females (***Table 1***, ***Figure 1***). Our study included 160 students from second year MBBS, 163 students from third year MBBS, 171 students from fourth year MBBS and 46 house surgeons.

Table 1. Distribution of study subjects according to their gender and year of MBBS study.

Batch year	Female [n (%)]	Male [n (%)]	Total [n (%)]
2nd year	103 (31.5)	57 (26.8)	160 (29.6)
3rd year	97 (29.7)	66 (31.0)	163 (30.2)
4th year	96 (29.4)	75 (35.2)	171 (31.7)
Intern	31 (9.5)	15 (7.0)	46 (8.5)
Total	327 (**100.0**)	213 (**100.0**)	540 (**100.0**)

Legend: Chi-square: 3.347, df: 3, p-value: 0.341, Statistically not significant.

Figure 1. Distribution of Study Population Based on Gender and Year MBBS.



In our analysis, 223 (41.2%) of the students thought that the ideal number of students in a class should be 50 to 100. 171 (31.6%) of them preferred class strength of less than 50 students. 349 (64.5%) of the students opined that the average class shouldn't exceed 45 minutes (***Figure 2***). Only 78 (14.4%) expressed that class duration of one hour was essential. Demonstration was best way to conduct a class according to 295 (54.6%) of the students. Only 110 (20.3%) students found that chalk and blackboard form of teaching helped them in understanding concepts. A majority, 272 (50.3%) of the students, preferred to clear their queries with their friends. 150 (27.8%) of them expressed an anxiety of ridicule if their doubts were expressed in front of the entire class (***Table 2***).

About 361 (66.7%) of the students thought that medical research is important in a medical institute. About 37 (6.85%) expressed the contrary (***Figure 3***). 223 (41.2%) of them thought that the sixth term (third year MBBS) was an ideal time to start a medical research project given the relative free time they had. Almost 177 (32.77%) thought that the third term (second year MBBS) was an ideal time to start a medical research project. 310 (57.3%) of them were interested in conducting a clinical research project. 121 (22.4%) of them wanted to research on pathogenesis of the diseases. Around 109 (20.18%) of them wanted to research on drugs that would cure current non-treatable conditions like cancer, diabetes, and hypertension. 310 (57.3%) of the students had no orientation on how to start a research project and that was why they had not done a research project yet. 82 (15.2%) of them thought that the professors don't encourage the students enough to conduct a research project. 77 (14.25%) of them thought that resources to conduct a research were limited or not accessible.

More than half of the students (292, 54%) believed clinical skills were the most important skill to be acquired by a successful doctor (***Figure 4***, ***Table 2***). 196 (36.2%) expressed that thorough theory knowledge was critical to become a successful medical practitioner. 217 (40.1%) of the students thought that the basic concepts were not taught to them during clinical postings. The postings included a mixed group of students from different semesters. The students from a lower term found it difficult to cope with concepts taught without the basics. 199 (36.8%) thought that clinical postings in some department were conducted without a patient and seemed more like a theory class. Around 260 (48.1%) of the students opined that exams should be based on multiple choice questionnaire patterns with an oral viva voce. 82 (15.1%) students expressed there was no need for exams at all (***Figure 4***).

Discussion

We conducted a questionnaire-based survey on 541 medical students in a prestigious Medical College of South India. We attempted to perceive the awareness of students regarding medical research. We tried to understand the shortcomings in the current teaching methodology and asked for inputs to improve the same. It is critical to have established teaching syllabus and protocols in place as it involves grooming the future doctors of the country. It is important to train doctors to inculcate the art of scientific thinking. Inventions and progress in medical sciences have been possible only due to original ideas and scientific thinking.

Framework for Classroom Teaching

A student centric teaching system is the first and foremost step to improve the quality of medical education being imparted to students. In our study, we found that 223 (41.2%) students preferred a class strength of 50-100 students, followed by 170 (31.6%) who wanted a class strength of less than 50 students. One reason that could substantiate this finding would be to improve the teacher to student ratio and by doing this, students can actively participate in discussions and as we know that active learning is the best possible way to grasp concepts and knowledge. In a study conducted by Maler et al, it was found that as the class size increases, the cognitive and activity scores among students decline.[2] Hence smaller class strength allows students to gain a holistic perspective to various topics/diseases taught, through these discussions. This has been proved in studies conducted by Pal et al, who discovered that small group teaching had a positive impact in augmenting students' knowledge, attitude and competency about the subject.[3] Competency levels increased from 13.7% to 26.9% after small group teaching was implemented.[3]

Figure 2. Favorable Teaching Method.

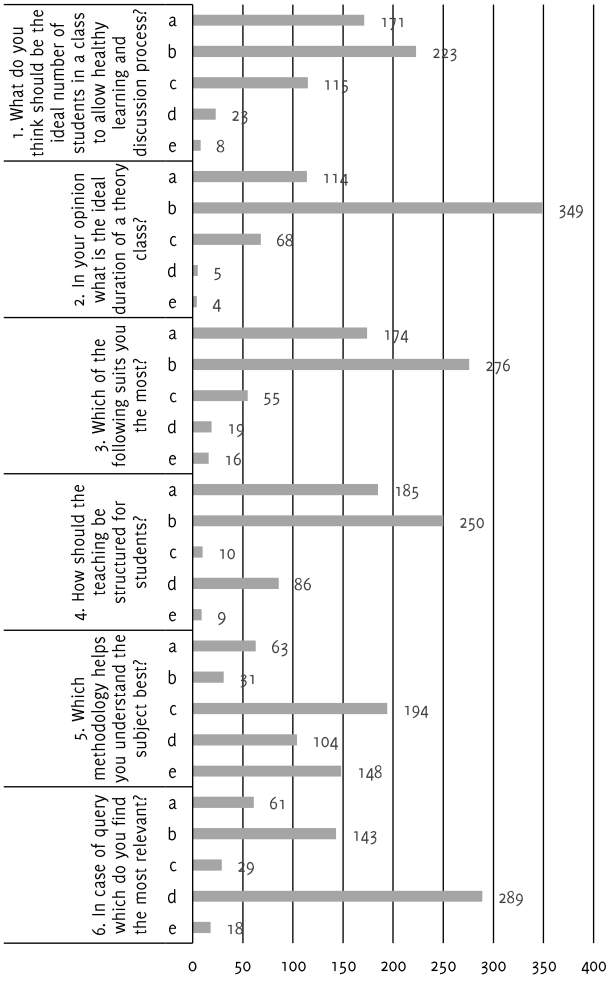


Figure 3. Interest of Medical Students Towards Research.

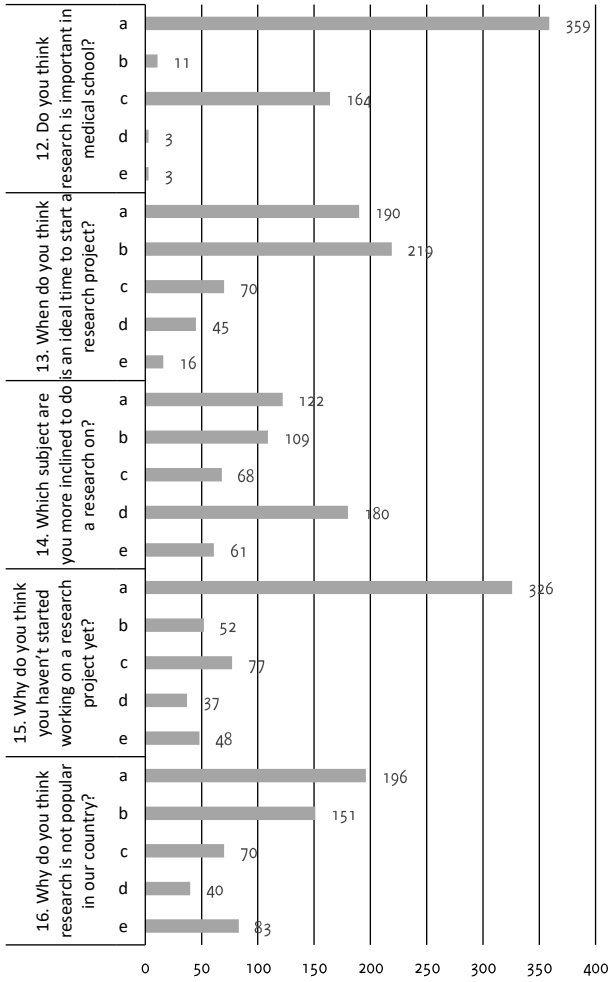


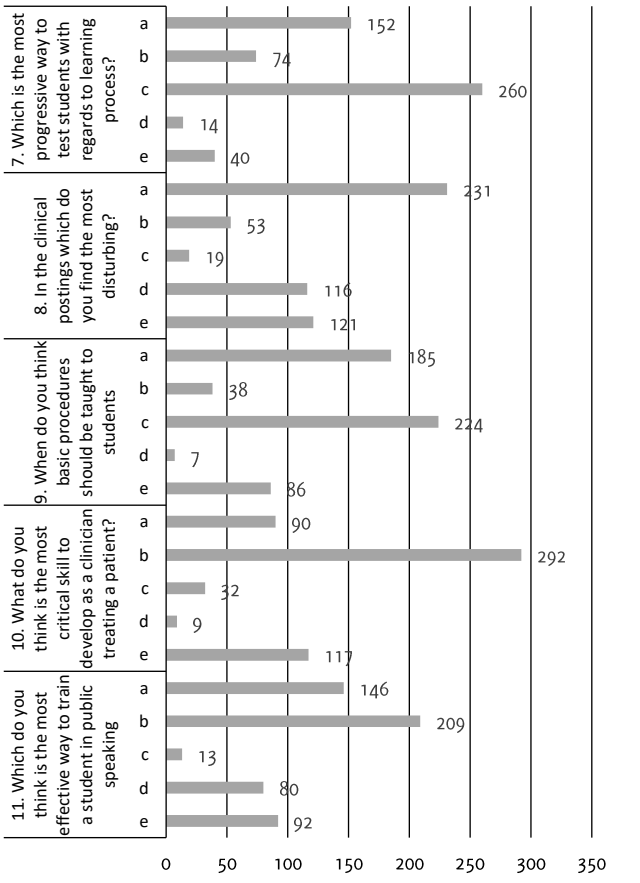
Table 2. Questionnaire Employed in Our Study. Questions 1-6 refer to teaching methods and classes, 7-11 to learning and posting, 12-16 to research, and 17-20 to future projects.

N°	Options	Question	YES	%
1		What do you think should be the ideal number of students in a class to allow healthy learning and discussion process?		
	a	Less than 50	171	31.7
	b	50-100	223	41.3
	c	100-150	115	21.3
	d	150-200	23	4.3
	e	Multiple answers	8	1.5
2		In your opinion what is the ideal duration of a theory class?		
	a	30 minutes	114	21.1
	b	45 minutes	349	64.6
	c	1 hr	68	12.6
	d	1 and half hr	5	0.9
	e	Multiple answers	4	0.7
3		Which of the following suits you the most?		
	a	Classes are extremely important for the learning process	174	32.2
	b	Classes are critical, but attendance should not be forced upon	276	51.1
	c	Classes maybe relevant only on most frequently tested topics in the exam	55	10.2
	d	I don't need classes, I attend them only for attendance	19	3.5
	e	Multiple answers	16	3.0
4		How should the teaching be structured for students?		
	a	Clinical Posting 3 hrs, Theory 3 hrs, Practical 1 hr	185	34.3
	b	Clinical Posting 4 hrs, Theory 2 hrs, Practical 1 hr	250	46.3
	c	Clinical Posting 2 hrs, Theory 4 hrs, Practical 1 hr	10	1.9
	d	Clinical Posting 2 hrs, Theory 3 hrs, Practical 2 hr	86	15.9
	e	Multiple answers	9	1.7

5		Which methodology helps you understand the subject best?		
	a	Chalk and board	63	11.7
	b	Power point presentations	31	5.7
	c	Clinical demonstrations on a patient	194	35.9
	d	Use of supplementary aids like animation videos, 3D illustrations, cadaveric studies etc.	104	19.3
	e	Multiple answers	148	27.4
6		In case of query which do you find the most relevant?		
	a	Teacher has no time for my doubts	61	11.3
	b	Teacher might make fun of me regarding my inadequate knowledge	143	26.5
	c	Teachers don't seem to be updated their knowledge to answer my doubts and dismiss m or change the topic	29	5.4
	d	It's easier to ask to my friends sitting in the first bench	289	53.5
	e	Multiple answers	18	3.3
7		Which is the most progressive way to test students with regards to learning process?		
	a	The current system of theory and practical	152	28.1
	b	Only Multiple Choice Questions with viva	74	13.7
	c	It should be a daily graded system to assess the regularity, punctuality and learning process of students	260	48.1
	d	We don't need exams	14	2.6
	e	Multiple answers	40	7.4
8		In the clinical postings which do you find the most disturbing?		
	a	Teacher does not explain concepts from a basic level because the students are from different terms	231	42.8
	b	We are made to sit in an empty room for 3 hours with no learning process	53	9.8
	c	Senior students bully us	19	3.5
	d	There is less patient based teaching and more theory-based teaching	116	21.5
	e	All of the above	121	22.4
		Multiple answers		
9		When do you think basic procedures should be taught to students		
	a	Skills should be taught on cadavers in 6th term	185	34.3
	b	Skills should be taught on cadavers in 8th term	38	7.0
	c	Students should be able to perform procedures in a live patient under supervision in 8th term	224	41.5
	d	Nothing should be done before internship	7	1.3
	e	Multiple answers	86	15.9
10		What do you think is the most critical skill to develop as a clinician treating a patient?		
	a	A sound theoretical knowledge of the specialty he/she is in	90	16.7
	b	The art of communicating with patient	292	54.1
	c	Empathizing the patient	32	5.9
	d	Running a thorough laboratory workup for the patient	9	1.7
	e	Multiple answers	117	21.7
11		Which do you think is the most effective way to train a student in public speaking		
	a	Seminar topics allotted to students	146	27
	b	Clinical presentation of a patient about his medical problems to the consultant doctor	209	38.7
	c	Anchoring in college fests	13	2.4
	d	Oral presentations or poster presentations in speciality conferences	80	14.8
	e	Multiple answers	92	17
12		Do you think research is important in medical school?		
	a	Yes	359	66.5
	b	No	11	2.0
	c	I'm not sure because I've not been in one	164	30.4
	d	Research is not for doctors	3	0.6
	e	Multiple answers	3	0.6
13		When do you think is an ideal time to start a research project?		
	a	3rd term	190	35.2
	b	6th term	219	40.6
	c	8th term	70	13
	d	Now is the best time	45	8.3
	e	Multiple answers	16	3
14		Which subject are you more inclined to do a research on?		
	a	Research at genetic level to understand the etiopathogenesis of a disease	122	22.6
	b	Research in drugs to find a better cure for existing diseases	109	20.2
	c	Research in basic sciences and paraclinical sciences to understand variations of normal anatomy and physiology in various population groups	68	12.6
	d	Research in clinical sciences regarding atypical disease patterns and outcomes of surgeries	180	33.3
	e	Multiple answers	61	11.3
15		Why do you think you haven't started working on a research project yet?		
	a	I have no idea how to go about it	326	60.4
	b	Teachers don't encourage research	52	9.6
	c	Limited available resources and difficulty accessing	77	14.3
	d	Not interested	37	6.9
	e	Multiple answers	48	8.9

16		Why do you think research is not popular in our country?		
	a	Hospitals are severely understaffed, and doctors are clinically overworked	196	36.3
	b	There is very poor funding aid by the government towards heath care	151	28.0
	c	Lack of financial incentives to the doctor	70	13
	d	It's easier to follow western data	40	7.4
	e	Multiple answers	83	15.4
17.		Which of the following do you think is apt for you		
	a	I would like to pursue post-graduation in India because of a patient load	225	41.7
	b	I would like to pursue post-graduation in India because I want to be with my family	101	18.7
	c	I would like to pursue post-graduation in the western countries because of advanced and better quality of patient care	144	26.7
	d	There is no difference between India and western countries n terms of health care	29	5.4
	e	Multiple answers	41	7.6
18.		Why do Indian doctors visit western countries for super specialty training/fellowships		
	a	It looks cool on the visiting card	28	5.2
	b	They are technologically more advanced in health services	260	48.1
	c	They have better clinical experience than Indian doctors	28	5.2
	d	They practice evidence-based medicine with authentic clinical research	154	28.5
	e	Multiple answers	70	13.0
19.		Why do you think famous people like cricketers, film actors, politicians prefer to receive treatment from doctors/hospitals outside India		
	a	They have more money	28	5.2
	b	They believe their standard of care and treatment is better as compared to Indian hospitals	335	62
	c	They have better skilled doctors with updated knowledge	54	10
	d	They are free from media interference	40	7.4
	e	Multiple answers	83	15.4
20.		What do you think is the most effective way to ensure development and progress in the field of medicine		
	a	Better funding from the government towards health schemes for the patient	77	14.3
	b	Better infrastructure with latest technologies made available in government hospitals	182	33.7
	c	Evidence based medicine from results of research done in an Indian population instead of following western data	155	28.7
	d	We are on par with the world with respect to health care	9	1.7
	e	Multiple answers	117	21.7

Figure 4. About Learning and Posting.



Another aspect to be considered in classroom teaching is the duration of each class. Almost 349 (64.5%) of the students believed that each classroom session should not exceed a time limit of more than 45 minutes. The results expressed in this study correlate with a study carried out by Najmi, in which 54% of the students felt that timing of lectures should be below 40 minutes.[4] Another study conducted by Mustafa showed that 54% of the students felt that timing of the lecture should be reduced and 92% of the students could not concentrate in class beyond 30 minutes.[5] Hence, the authors feel that in order for the teaching to be effective, high yield conceptual teaching should be practiced in shorter duration of classes.

For active learning to take place, there has to be active teaching. It was a common opinion of students that a few professors lacked the skill of effective teaching. They also expressed that a class was prioritized around completing the curriculum rather than trying to analyze the student's knowledge of the topic taught. Higher percentage of students felt that importance was given to the classes' attendance rather than content learnt from each class. Our study revealed that the students felt that professors needed to be more interactive while teaching; they need to engage students into the subject and should focus on demonstrations rather than PowerPoint presentations/use of blackboard. Our study shows that 292 (54%) of the students prefer demonstrations rather than the latter modes of teaching. On the contrary, various studies done earlier showed that Microsoft PowerPoint® presentation was the preferred method of teaching but that too has faded in the recent times and this just proves to show that the teaching system needs to be continuously updated. The advent of the case-based learning and integrated teaching along with other innovative techniques also seem to have picked up the pace in the recent years as seen in studies conducted by Joshi and Ganjiwale, who conducted an innovative teaching session in a medical college in the state of Gujarat in India.[6] This teaching methodology was widely accepted by students, 92% of the students felt that the teaching method was enjoyable and generated more fun and interest among them, 92% of the students felt that the teaching method implemented

in the study helped them improve their foundational knowledge about the subject, and 87% of the students felt that this particular method of teaching helped retain specific information effectively and also wished a similar method would be employed on a regular basis.

Datta et al., studied the use of an interactive response pad to aid teaching in Armed Forces Medical College, Pune, India and found that using this methodology of teaching, students were able to score about 8-10% higher in the immediate post-test analysis and 15-18% higher in a test conducted 8-12 weeks later.[4,7] Zhao et al., conducted a study at the University of Iowa comparing lecture-based learning with discussion-based learning among third and fourth year undergraduate medical students.[8] They found that mean scores for the follow-up practical examination was much higher in the interventional group than in the control group. Students also felt that they were able to manage a case of gastroschisis better in the interventional group and found that discussion-based learning was a worthwhile educational experience for that particular topic. However, there was no difference in the Multiple-Choice Questions (MCQ) examination that was conducted among the two groups post the study. Smits et al studied the difference between problem-based learning and lecture-based learning among postgraduate students in the Netherlands.[9] They found out that both methods were favorable but postgraduate students in the problem-based learning group had higher performance indicator scores than the group receiving lecture-based learning. Das et al. studied first-year medical students evaluating the effectiveness of clinical exposure in learning respiratory physiology.[10] The study showed that students performed much better in the post-test analysis when they received clinical exposure than students who did not, with 92% acceptance rate among students. McMenamin et al., studied body painting as a tool to understand anatomy and found out that body painting promoted knowledge retention and recall through the process of cognitive load by combining the use of color and kinesthetic learning.[11,12]

Bharadwaj et al involved integrated teaching using case-based learning to learn a certain topic.[13] The sample was divided into two groups one that received the integrated teaching and the other that only received a didactic lecture. They found out that students who received integrated based teaching retained better and scored much better.[13] From all the aforementioned studies, a message that flashes blatantly is that change in the methodology of teaching is important and teachers of the present generation need to go beyond the conventional methods of teaching to help students understand better and impart knowledge more effectively.

Medicine is vast and challenging. The authors expect students to pose numerous questions and be eager to seek clarifications from the teachers. On the contrary, our study showed that more than half of the students would rather clear their queries with their peers rather than the teacher. The predominant reason was that they were apprehensive about social ridicule in front of the entire class. This led the authors to believe that the teachers must strive to create an encouraging environment for the students to ask their queries. Arguably, the ability of a student to ask questions fearlessly is more to with the student's mindset rather than a change in the teaching pattern. Laughing or mockery of the naivety of a student's question just creates a greater divide between the student and the teacher. The authors feel that it would be ideal for a teacher; to embrace the fact that this is bound to happen and clear queries with utmost patience by gaining the confidence of the students. A study conducted by Arghode et al., showed that empathy plays a role in students' learning and helps improve their performance in the classroom setting. However, the degree to which a teacher should empathize with students is variable depending upon the situation.[14]

Framework for Clinical Postings

From the second year, a MBBS student's day consists of theory lecture classes, clinical bedside postings and laboratory classes. Our study aimed to find out what would be the perfect balance to conduct all three in a single day. Two hundred fifty-two (46.5%) of the students felt that clinical postings should be given utmost importance. They wanted a revision of the time allotted to each component. They felt that acquiring clinical skills rather listening to theory classes was the most important aspect of becoming a good doctor: about 292 (54%) vs. 195 (36%). Conclusions drawn from the results of our study showed that Clinical Postings should be allotted 4 hours, whereas theory and practical classes should be allotted 2 hours and 1 hour, respectively. In a study conducted by Mustafa, a staggering 83% of the students felt that lectures should be replaced with clinical sessions because of the smaller strength of the class, active student participation and enhanced clinical orientation and interaction with patients.[4] The same was observed in a study conducted by Najmi: 79% of the students felt that lectures should be replaced by clinical session for similar reasons mentioned above.[5]

In our study, students also felt that an alteration in teaching methodology makes clinical postings more efficient. Since a clinical posting class comprises of a mixture of students from all years, it becomes difficult to conduct a class for students with varying levels of knowledge. Our study proves that this form of teaching methodology employed is inefficient as about 216 (40%) of the students felt that they weren't being taught the basics and the students from the fresher years found it difficult to cope with the material being taught to them. A study conducted by Favrat et al., evaluated the implication of bedside teaching in cardiology. They found that 69% of the residents who received the cardiac auscultation training session could correctly identify murmurs and 62% could make a correct diagnosis. However, those who did not receive the training session could identify only 40% of the murmurs and only 21% could make a correct diagnosis.[15] In another study conducted among sixth year medical students in Germany, the authors found that the students who received bedside training under the guidance of a neurologist scored higher in practical and written examination scores 16.3%.[16] The authors concluded that it would be effective if bedside clinical teaching was taught from a basic level and the duration of these clinical classes was increased to four hours.

A study conducted by Zakarija-Grkovic and Simunovic implemented the use of objective structured clinical examination (OSCE) for undergraduate students at the University of Split to assess clinical competencies.[17] A similar model of assessment can be adopted for students of the lower terms instead of them directly handling real patients. This way their foundation will be stronger, and they would be confident to perform the clinical examination on patients.

Students felt that basic procedures should be taught earlier rather than waiting till they reach internship. About 178 (33%) of the students felt that basic procedural training should start from sixth term (third year MBBS) and should be allowed to perform on cadavers. Also, 225 (41.6%) of the students felt that basic procedural training skills should be taught in the eight terms (fourth year MBBS) on live patients under supervision. This pattern of results is in sync with the study conducted by Zakarija-Grkovic and Simunovic.[17] Hence the lower term students can be taught skills on models and prepare them for the OSCE whereas the higher term students can be transitioned to demonstrate clinical skills on live patients.

Framework for Research in Medical Education

Research, the biggest component of medical education, is neglected in our education system. A majority of students 362 (67%) felt that research is an important aspect of medicine and should be included in our curriculum. Almost 314 (58%) of students were ready to carry out a research project. However, most of them 408 (75.43%) felt that they were not given enough guidance or encouragement on how to do so. Very few students 77 (14.25%) felt that there were limitations in resources to carry out a research project in the form of lack of a

research guide, knowledge and awareness on how to conduct a research project and evidence-based medicine.

A study conducted by Kotwal proved the same.[18] With the right guidance and mentorship, the students who submitted projects received approval. Farzaneh et al., conducted a study to identify the restraining factors to conduct research among students in Ardabil University of Medical Sciences in Iran.[19] Among students, the biggest factor was access to a credible information source and lack of fluency of the English language. Among teachers, the biggest hindrance was administrative barrier and preoccupation with work. However, in our study we did not find any of the aforementioned factors among students.

Another study conducted by Hasan et al revolved around the same issue which was barriers among students in conducting a research project in Isfahan University of Medical Sciences in Iran.[20] The results of this study were similar to ours. Students felt that they lacked knowledge regarding carrying out a research project or publishing an article in a journal. They also faced problems regarding economic, social, cultural and organizational aspects, which was not the case for the students in our country. They proposed to conduct more workshops regarding research methodologies, article writing and also called out to all the administrators to provide guidance to students willing to carry out a research project. This model can also be adopted by us and will help students gain in depth knowledge and orientation towards research. Another model, which will be useful, is the mentorship program for students similar to the one conducted by Kotwal. [19] From the above findings we can infer that even though we are at a much better position than other countries to conduct research, we aren't able to do so because of lack of knowledge and proper guidance. Hence, we must concentrate on improving those particular areas so that students can benefit and carry out research projects without facing significant hardships.

Framework for Conducting Examinations

Our study tried to understand the needs of the medical students on how they would like to be tested. About 260 (48.1%) of students felt that Multiple Choice Questions (MCQs) along with oral Viva Voce was the best way to assess a medical student. The authors feel the current system of theoretical long essays and short essays should be brought to an end because students formulate answers based on memory and not concepts. The length of the answers seems to take precedence over than content of the answer. With MCQs, the students have to understand the tested concept to score well.

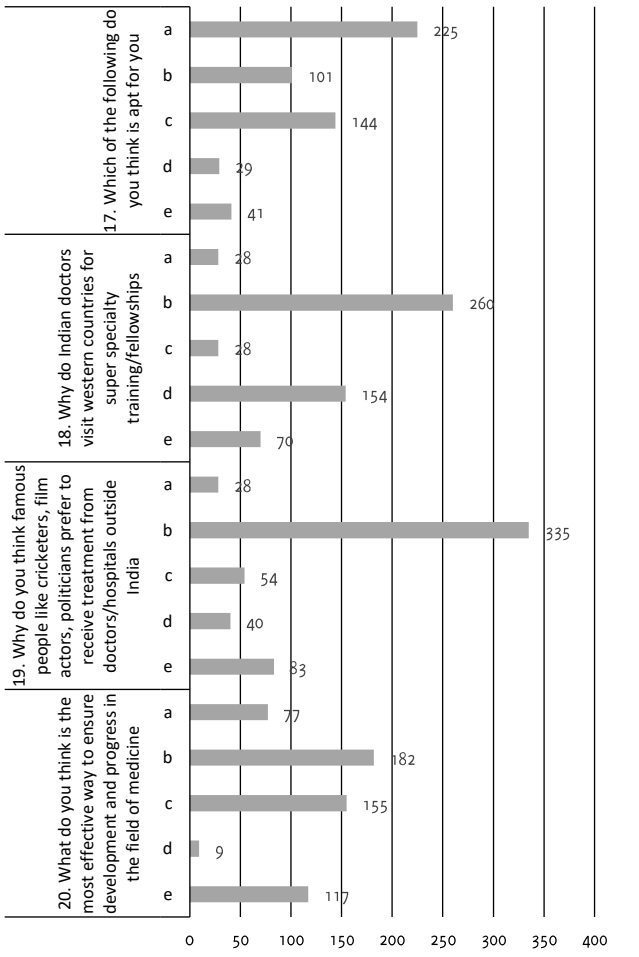
A study was conducted at the University of Adelaide by Palmer et al to understand the role of MCQs vs. Modified Essay Questions (MEQs) in testing higher order cognitive skills.[21] They found that MCQs are better as they tested higher order thinking skills (Modified Bloom's taxonomy class III) much more frequently than MEQs (20% vs. 2% respectively) and it stood the test of statistical and intellectual scrutiny when it involved a high-stake exit exam.

Framework for the Future of Medical Education

In our study, we asked students what would be ideal for their future as a medical professional. We asked them to opine regarding the changes required to help the medical system be on par with the rest of the world. 242 (44.8%) of the students still preferred to stay back in India and pursue their postgraduate education here because of the excellent patient load. About one-third said that they prefer going to other countries to pursue their higher studies (***Figure 5***).

Almost half of the students (260, 48.1%) felt that Indian doctors go abroad because the health care services are much better, and they are technologically more advanced compared to India, 216 (40%) of felt that evidence-based medicine and clinical research is being given utmost importance in the west and they feel that it suits their way of practice and learning. A study conducted by Bhatt et al., showed that incidence of migration among medical graduates in Baroda, India is close to 40% which is similar to the results obtained in our study.[22] Among those, 77% go to the United States and 11% go to the United Kingdom. The reason for migration is comfortable living conditions and research facilities.

Figure 5. Decision to Pursue Higher Education.



Majority of the students felt that the current system of education in our country should adopt evidence-based medicine and give more importance to clinical research. They also felt that the system needs an influx of more funding from the government to improve health care facilities. If the medical system ever adopts these changes, the issues of brain drain would reduce, and our medical system could be one of the best in the world. A study conducted by Coomaraswamy et al., focused on the impact of evidence-based medicine in postgraduate medical education in the UK.[23] They found that evidence-based medicine has an edge over standalone teaching as it not only improved knowledge but also improvement in skills, attitude and behavior was observed.

The limitation of this study was in the age of the participants. Although the zeal to innovate is well received by the authors, the authors feel that there could be a possibility of impulsive responses marked by a few students. It is a normal response for a student to dislike classes and the duration of the classes. A balanced gradient-based change would be ideal to transform the current teaching methods. This study was conducted in a single medical institute. Hence, the opinions of this participant group may not however replicate the opinion of the entire South Indian medical population. The authors, however have been trained in various medical institutes across the Indian subcontinent and

they feel that the problems exposed in the results of this study is real and is well justified and not just an area-based problem.

Conclusion

The students desire a change in the medical education system. They want the system to evolve and progress, their preference has shifted from the current classroom-based teaching to newer integrative methods and patient-based learning. They are eager to get hands on clinical patient-based experience. Majority of them are extremely interested in medical research but have limited guidance and direction. This study highlights that without proper guidance and mentorship the medical students cannot excel in research-based activities and projects. Finally, the authors concluded that significant changes in the current education system are required to ensure efficient training of medical students.

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Author Contributions

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Original Article

Smoking habits among medical students: a survey at the University of Prishtina Faculty of Medicine

Albina Fejza, Fatjeta Maraj, Hajrullah Fejza.[1]

Abstract

Background: Smoking is a common habit among the population in Kosovo. In the country, smoking occurs in public places, health and educational institutions despite being prohibited by law. The objective of our paper is to describe smoking habits, knowledge and attitudes among medical students from all departments in the University of Prishtina, Faculty of Medicine. **Methods:** The present study followed the Global Health Professions Student Survey (GHPSS) standardized methodology including data processing procedures. A self-administered questionnaire was used adapted from the GHPSS. A total of 600 students were invited in the study while 470 (78.3%) responded to the questionnaire. Descriptive statistics were used to present the data. The Fisher's exact test was used to test the significance and a p-value<0.05 was considered significant. **Results:** We found out that the prevalence rate of smoking among students is 16.9% (95% Confidence Interval [CI] 13.2-20). 79 students are current smokers, 28.2% of all males and 7.7% of all females. The study showed that 55.5% of student smokers smoke less than a pack of cigarettes per day. Almost half (47.6%) of those who smoke reported to have a smoker inside the family. This study also revealed that 74.7% of respondents who smoke do so in the presence of non-smokers on daily basis. **Conclusion:** In addition to threatening their own health, smokers also present a societal public health risk and medical students should be role models for the others by not smoking. Even though the percentage does not show a high rate of smokers in the Medical University of Prishtina, we still need to pay attention to smoking habits and try to lower the percentage of smokers.

Key Words: Smoking; Medical Students; Kosovo; Tobacco; Public Health (Source: MeSH-NLM).

Introduction

Smoking at the early stage of life is a common habit among the population in Kosovo. Smoking persists to be a problem worldwide with a lot of health consequences. By 2030, approximately 70% of deaths attributable to smoking worldwide are expected to occur in low- and middle-income countries. [1] In a systematic review of the literature, conducted by Smith and Leggat, they concluded that smoking among male medical students is in a range between 3% in the USA and 58% in Japan. [2] In our country, which is a low-income country, smoking occurs in public places, health and educational institutions even though it is prohibited by law. The irony is that people also smoke in the Assembly's hall, which is the place where the law that bans smoking in certain areas was ratified. Another concerning fact that results in increasing the number of smokers is that cigarettes are sold to people of any age, without checking their IDs. Even more concerning is that children sell cigarettes in restaurants and streets. In addition to its many negative social and economic implications, tobacco is also a factor which leads smokers to many disorders, disabilities, or even death. [3] According to M. B. Allen, health problems and consequences related to tobacco will rise as new markets develop. [4] Each year 5.4 million deaths occur due to tobacco use. [5]

In order to reduce the rates of morbidity/mortality, medical professionals are expected to incorporate efforts to reduce smoking in their practice. As a privileged category in our University, medical students should be role models for their peers. Smoking among medical student has a negative impact and it can only be tackled through using appropriate educative methods. The most likely method which would further emancipate the future doctors regarding smoking habits and consequences is implementing a module in University's syllabus for Bachelor level of study.

Physicians can play a pivotal role in educating patients about the smoking risks and dangers. However, their own smoking habits might unintentionally affect the smoking behavior of others. [6] Of special interest is the decrease in the percentage of smokers among most health professionals, particularly physicians. [7] Since health care professionals can easily access the relevant data and research in the field of smoking effects on health, they are believed to be aware of the smoking consequences. [8] Among Russian students who study medicine were found high levels of smoking, hypodynamia, and motivation to intake unhealthy food compared to those students who aspire to be future teachers and wellness instructors. [9]

Experimental smoking is a new aspect of smoking. We believe that it is mainly caused in night clubs where it is most likely for students to try drinking and smoking. Such environment cues reduce their ability to resist. A study conducted in India shows an increased risk of smoking in medical students who have experienced experimental smoking in their past. Therefore, the study suggests that medical schools must include more tobacco education lessons and training in order to prepare their students in dealing with smoking problems, whether for themselves or for their patients. [10] Also, it should be noted that smoking associated environments might increase the urge of smoking and make it difficult for smokers to quit. [11] In many countries smoke-free laws, which ban smoking in public venues, have proven to be effective in protecting public health; however, this may be less applicable

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to low- and middle-income countries since there are difficulties in achieving compliance with these laws. [12]

The main goal of this study is to investigate the knowledge and attitudes of medical students toward cigarette consumption. The significance of the study is to emphasize the crucial role that medical students play by providing a good example to their peers.

Methods

A cross-sectional study was conducted from September to December 2015 using a self-administered questionnaire derived and adapted from the Global Health Professions Student Survey (GHPSS), developed by the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and the Canadian Public Health Association (CPHA). GHPS has a standardized methodology for selecting participating schools and classes and uniform data processing procedures.

Study settings: The study setting was Medical Faculty, at the University of Prishtina, which according to Wikipedia data is a public higher education institution, based in Kosovo, with approximately 40,000 students. About 5,000 students receive bachelor or master degrees every year at University of Prishtina. More than 70,000 have graduated from the university since its establishment in 1968. Medical faculty consists of six departments: Medicine, Dentistry, Pharmacy, Nursing, Midwifery and Physiotherapy.

Sampling and participants: With 95% CI and 3% possible non-responses bias the sample size was calculated to be 600. The response rate was 78.3% (470/600). This study included students from all years of study in all departments of the Medical Faculty.

Variables: The GHPSS used in our study is adapted and modified by Georgios-Marios et al to fulfill the goal of the study. [16] The questionnaire was translated from English to Albanian, back translation into English and the final version was done by a third person checking translation in case of possible errors. There were included demographic data, prevalence of smoking, the number of packs smoked per day, smoking in presence of non-smokers, other smokers in family, passive smoking, addiction and how students think they should be as role models to other peers. The demographic predictor variables were gender, age when they started smoking, and department of study.

Data Collection: The questionnaire was administrated online on Survey Monkey platform during a four-month period. The research was approved by the ethical committee of Medical Faculty, University of Prishtina. Also, the researchers had made it clear and emphasized to the students that the participation was voluntary, and the results would remain confidential. Since not all the students agreed on partaking in the study, the first 100 volunteers from all six departments of Medical Faculty were chosen to be part of the study sample.

Data Analysis: Collected data was cleaned and tested with Statistical Package for the Social Sciences (SPSS) 20.0. The confidence interval was performed by the same software (SPSS). The Fisher's exact test was used to test the significance. A p-value <0.05 was considered significant.

Results

A total of 600 students (100 from each department) from all departments were invited to participate in the study by filling in a questionnaire. Those who agreed to participate and completed the questionnaire (470) were included in the study. The response rate was 78.3% (470/600).

From the total number of respondents (470), 44.4% were male and 55.6% female. The prevalence rate of smoking was 16.9% (95% CI 13.2-20). Smoking habit is not present in the same rates between male and female. Male students tend to smoke much more compared to their female colleagues (p<0.005). Among the smoking group of students, 28.2% were male and 7.7% female (**Table 2**). More than four fifths (83%) of the smokers started smoking between the age of 16 to 24. Almost half of them (47.6%) who smoke reported to have a smoker inside the family. From the participants' perceptions, 38.4% consider that passive and active smoking equally dangerous, while 36.9% think that passive smoking is more dangerous than the active one. Three hundred and four students declared that smoking causes both physical and psychological addiction (**Table 1**). Fisher's exact test is used for p-value.

Table 1. Main Findings of Our Study.

Variable	Answer	No.	%
Gender	M	209	44.50
	F	261	55.50
Smoker	Yes	79	16.80
	No	391	83.20
The age of beginning	< 16 years	10	12.70
	> 16 years	69	87.30
Smoking in front of non-smokers	Yes	78	75.00
	No	26	25.00
	Not at all	10	2.10
How harmful can passive smoking be	A little	106	22.60
	Same as active	181	38.50
	More than active	173	38.80
Addiction	Physical	157	33.40
	Psychological	7	1.50
	Both	306	65.10
Medical students as role models	Yes	423	90.00
	No	47	10.00

Table 2. Correlation between Smokers and Gender.

	Smoker		
Gender	Yes	No	p-value
M	59 (28.2%)	150 (71.8%)	
F	20 (7.7%)	241 (92.3%)	< 0.05
Total	79 (16.8%)	391 (83.2%)	

Smoking consequences are correlated with the consumption in one day. When asked on how many packs they smoke per day, 58.2% of participants claimed that they smoke less than one pack of cigarettes per day. Only 3.8% of them smoke more than one pack/day.

One of the most interesting findings from this survey was the role model of medical students in their appearance and influence among peers and younger population. Both male and female agreed that medical students play a crucial role as a good model for the others. Male with 84.7% and female with 94.3% believe that they should set a good example to other mates regarding smoking habit (**Table 3**).

Table 3. Correlation between Gender and Model Role.

	Model role		
Gender	Yes	No	p-value
M	84.70%	15.30%	
F	94.30%	5.70%	> 0.005
Total	90.00%	10.00%	

Discussion

According to our findings, the smoking prevalence among medical students in Kosovo is 16.8%. The percentage of students who smoke is below the average compared to other studies conducted worldwide. The rationale behind this is perhaps their orientation toward becoming future health professionals. Moreover, smoking, despite the health side effects, can be a disadvantage in job seeking or sharing living and working place with others. Until now there is no data about the smoking rate in the general population in our country. Ashwin A. Patkar in his study found that among 397 students, medical students smoking prevalence was (3.3%) compared to nursing students (13.5%). [13] Based on the 2012 Euro barometer Report, the prevalence of smoking in the European population, where Kosovo belongs, aged . 15 years is 28%. [14]

In Jeddah, 24.8% male and 9.1% female medical students continue to smoke even though they are well-educated and have good knowledge regarding the hazards of tobacco consumption. [3] Meanwhile at the Berlin Medical School the smoking rate was 22.1% among women and 32.4% among men. [6] The prevalence rate of smoking in the University of Health Sciences in Vientiane was lower compared to our students. There was reported to be a low percentage of health professional students who claimed smoking, only 5.1 %. [2] Whereas in the city of Mosul, Iraq, the prevalence of cigarette smoking was 17.9%. [15] In the study among Japanese medical students the prevalence of smoking among men was significantly higher than among women (18.1% vs. 5.1%). [7] Smoking prevalence, among medical students of the Democritus University of Thrace was 24% (**Table 4**). [16]

Table 4. The Prevalence of Smoking among Medical Students in Different Studies.

Authors	The overall smoking prevalence
Fejza et al.	16.80%
A. Patkar et al.	13.50%
Siraj O. Wali	14.00%
B. Kysma et al.	25.20%
V. Singh et al	31.50%
R.M. Coe et al.	5.1-6.2%
T. Tomki et al.	13.70%
V. Sychareum	5.10%

Almost all our respondents agreed that medical students should be role models for other students and the public in general. In the study conducted by Sychareun, non-smokers were more likely than smokers to agree that health professionals should be role models; while both smokers and non-smokers strongly agreed that health professionals should give advice about quitting smoking. Ninety percent of respondents in Jeddah thought that doctors should set a good example by not smoking. [2] The Jordan authors in their study emphasis the importance of non-smoking policies within the university. [17]

The prevalence of smoking among adolescents increases with age. There is therefore a need for school-based tobacco prevention programs which also deal with family influences on smoking. [18] As most university students including those at medical school, would have limited financial means, it is reasonable to assume that any legislation increasing the price of tobacco would subsequently result in a drop in the overall number of student smokers. [19] This could be a good proposition for our country having in consideration the low family budget as well as the financial dependence of students on their families. Only a few of them can find a job to fund themselves while pursuing their studies.

Future studies should use longitudinal designs that can identify psychological and socio-environmental determinants of smoking among college students. Such information could inform the development of smoking prevention and cessation interventions targeted to the college student population. [20] The readiness and attitudes among our students to contribute in this study indicate that prospects are good for future investigation with the aim of finding a way to assist authorities in identifying a strategy for reduction and cessation of smoking among students. In our country smoking in closed areas is prohibited by Law, but despite that, lots of people still smoke due to the lack of consequences by authorities. The majority of respondents in a Lagos study supported a ban on smoking in homes (83.5%), in public places (79.2%), and in restaurants, nightclubs and bars (73.6%). [21] There are no ongoing initiatives within our school curricula in terms of promoting smoking cessation.

There are several trials that have proven the effectiveness of pharmacist-provided smoking cessation counseling in the inpatient, community, or clinic setting. [22] The cohort study conducted in US and Canada, which randomly selected over 13,000 smokers, showed that those subjects that had 2 or more quit attempts were more likely to stay smoking-free. [23] Medical professionals possess the greatest potential to promote a reduction in tobacco use. The role of pharmacists, in particular, is also important, because they have a wide client base that presents regularly, and, in many countries, smoking cessation aids are retailed in pharmacies. [24]

At nine German medical schools, students were involved in providing counseling teaching courses in novel smoking cessation for medical students. [25] Students, from a study done in Turkey, have shown willingness in taking new specific training that would advance their knowledge about tobacco; they also admitted that it would be beneficial to implement curricula's in tobacco cessation. [26] Hospital systems in the USA are adopting strict nicotine-free policies excluding hiring individuals who smoke, including residents for graduate medical training. [27] On the other hand, no cessation smoking program has been designed for students in our schools, including medical school. Some of the reasons for that are the low public interest, lack of funds, and the reluctance from professors to promote non-smoking habits.

The limitation of this study is that smoking status was self-reported by the respondents of the questionnaire, which might have led to possible biases; however, we included participant from all Departments in the Faculty of Medicine, therefore including a wide number of participants and perspectives.

Conclusion

We conclude that despite the low percentage of smokers among students, some of the habits, such as smoking in presence of non-smoking peers, should not be happening and there is a need for further activities and more educational promotion on this issue. In order to lower the current percentage and to discourage students from smoking, it is fundamental to increase students' awareness by including smoking prevention in each Departments' curricula.

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Short Communication

Do Thai Medical Students Understand What Does 'AEC' Mean? A Cross-sectional Survey

Jathurong Kittrakulrat, Ravipol Jurjai, Witthawin Jongjatuporn, Nicha Jarupanich, Annabel Bhamani, Krit Pongpirul.[1]

Abstract

Background: Thai medical students are inevitably involved in the regional collaborative movement of 10 countries toward the ASEAN Economic Community (AEC), this study explored how well they understand the term. **Methods:** Twelve students proposed an abbreviation list, which was then rated for their difficulty level by another 55 students using a 5-point Likert scale. Three easy, three medium and three difficult abbreviations were randomly chosen and randomly listed in the final questionnaire, along with 'AEC'. Another randomly selected 60 students were asked to write the full term of the 10 abbreviations. **Results:** Of 34 abbreviations in the initial list, the selected terms were: CMCTSD, SRL, LSC, SOS, AM, LOL, WHO, USA, UK. They were correctly answered in 0, 0, 0, 6.67, 13.33, 46.67, 81.67, 96.67, and 98.33 percent, respectively. AEC was deemed moderately difficult, as 30% correctly expanded the abbreviation. **Conclusion:** Majority of medical students lacked an understanding of the current AEC movement.

Key words: Medical Students; Linguistics; Thailand; ASEAN; Economy (Source: MeSH-NLM).

Introduction

The ASEAN Economic Community (AEC) is a collaborative group of ten countries - Brunei Darussalam, Cambodia, Indonesia, People's Democratic Republic of Lao, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam - that aims to promote economic strength in the region. According to the Mutual Recognition Arrangement (MRA), the physician is one of the seven professions who will be formally allowed to move across ASEAN countries to areas in which greater influx of patients is anticipated.

Countries have prepared themselves to ensure maximum competitive advantages.[1, 2] Despite a number of strengths of medical education in Thailand, the English language has been of great concern. The total Test of English as Foreign Language (TOEFL) Internet-based Test (iBT) score between January 2014 to December 2014, revealed that people from Singapore, the Philippines, Malaysia and Indonesia have significantly better English ability than the Thai population.[3]

As future physicians, Thai medical students will inevitably be involved in this regional movement and their awareness should, therefore, be assessed and promoted. This study was conducted by a group of Thai medical students aiming to explore how well their colleagues understand the term AEC. The basic premise is that the extent to which a non-English speaking medical student understands this regional movement could be indirectly assessed by asking them to spell out the term. This approach was designed to minimize the tendency to answer questions untruthfully (response bias), which may happen if medical students were asked about the AEC movement directly.

Methods

We applied sequential exploratory mixed method design.[4] Firstly, 12 third-year medical students were randomly selected based on student identification number. Each of them was given the American Heritage Abbreviations Dictionary and asked to come up with an initial list of 3 abbreviations with varying degree of "difficulty", defined based on the extent to which their colleagues understand its meaning. Any incidental duplicated word was removed.

Secondly, the "Difficulty Assessment" (DA) questionnaire was developed based on the abbreviations identified from the step above (***Figure 1***). During the one-week study period, DA questionnaire was distributed to a convenient sample of students whom the investigators met during 8 AM – 9 AM in front of the library of Faculty of Medicine, Chulalongkorn University. A participant with a valid medical student identification card issued by the Faculty of Medicine, Chulalongkorn University was considered eligible. They were asked to respond to the question "I agree that each of the following words is difficult," using a 5-point Likert scale (1, Strongly Disagree; 2, Disagree; 3, Neither Agree or Disagree; 4, Agree; 5, Strongly Agree). The respondents were asked to complete the DA questionnaire to make sure that there were no missing responses. Mean difficulty score for each abbreviation was calculated and sorted into 3 levels, ranging from 1 (easiest) to 3 (hardest), respectively. Thirdly, three words from each difficulty level were randomly selected. These nine words were randomly mixed with the term AEC to make the final list of 10 abbreviations to be used in the "Comprehension Assessment" (CA) questionnaire (***Figure 2***).

During the one-week study period, CA questionnaire was distributed to a convenient sample of third-year medical students (representative of preclinical student group) and sixth-year medical students (representative of clinical student group) who the investigators met during 8am-9am in front of the library of Faculty of Medicine, Chulalongkorn University. A participant with a valid medical student identification card issued by the Faculty of Medicine, Chulalongkorn

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Figure 1: Difficulty Assessment (DA) Questionnaire

Difficulty Assessment (DA) questionnaire

Gender ___ Male ___ Female
What faculty you are studying? _____
Which year you are studying? _____

How do you agree that these following abbreviations are difficult?

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
ABC					
AM					
ASEAN					
ASAP					
ATM					
BMTA					
CIA					
CMCTSD					
CU					
DOTA					
DVT					
FBI					
HTS					
ICU					
LOL					
LSC					
NDA					
N/A					
OMG					
O/E					
PE					
RIP					
SDL					
SOS					
SRL					
STD					
TGIF					
TIA					
UK					
UN					
UFO					
USA					
WHO					
WWW					

Figure 2: Comprehension Assessment (CA) Questionnaire

Comprehension Assessment (CA) questionnaire

Gender _____ Male _____ Female
Year of medical course you are studying (1st-6th) _____

Direction: please write the full terms of these abbreviations

1. CMCTSD _____
2. SOS _____
3. SRL _____
4. WHO _____
5. USA _____
6. LSC _____
7. LOL _____
8. AEC _____
9. UK _____
10. AM _____

Remark: In case there are many full terms of the abbreviations, please write only one full term.

University was considered eligible. It was unlikely that medical students who were aware and unaware of the AEC movement would be differentially present at when and where the study was conducted. Each of them was asked to write the full form of these abbreviations. The responses were assessed based on comprehension rather than exact spelling. A perfectly correct answer despite misspelling received one point whereas incorrect or no answer received zero points. The respondents were asked to complete the CA questionnaire to make sure that there were no missing responses. Descriptive statistics included mean, standard deviation and frequency. Spearman's correlation rank test was used to assess whether the rankings of the nine words were different from expectation.[5] Statistical significance was defined as p-value <0.05. Stata/MP 15 (StataCorp LLC, College Station, TX) software was used for the analysis. As this study collected only the subjects' opinion but not identifiable data, it was exempted by the Institutional Review Board Faculty of Medicine, Chulalongkorn University.

Results

A total of 36 abbreviations were identified by the first group of 12 medical students. After removal of two duplicates, 34 terms were included in the DA questionnaire. Alphabetically, they were ABC, AM, ASEAN, ASAP, ATM, BMTA, CIA, CIMCTSD, CU, DOTA, DVT, FBI, HTS, ICU, LOL, LSC, NDA, N/A, OMG, O/E, PE, RIP, SDL, SOS, SRL, STD, TGIF, TIA, UK, UN, UFO, USA, WHO and WWW.

The DA questionnaire was given to 55 students (26 preclinical medical, 17 clinical medical, five nursing, four pharmacy and three rehabilitation science students). The average age was 20.8 years and 58.2% were female. The nine randomly selected words for CA questionnaire and the mean difficulty scores were CMCTSD (mean 4.53), SRL (4.15), LSC (4.13), SOS (2.49), AM (2.49), LOL (2.42), WHO (1.49), USA (1.44), UK (1.42) (***Table 1***).

Table 1: Mean Difficulty Scores of the 9 Abbreviations

Abbreviation	Meaning	Mean Difficulty Scores
CMCTSD	Cape May County Technical School District	4.53
LSC	Lost sexual contact	4.13
SRL	Space Radar Laboratory	4.15
SOS	Save our soul	2.49
AM	After midnight	2.49
LOL	Laughing Out Loud	2.42
WHO	World Health Organization	1.49
USA	United States of America	1.44
UK	United Kingdom	1.42

The CA questionnaire was given to 60 medical students (40 were 3rd year and 20 were 6th year), with a response rate of 100%. The average age was 21.20±1.22 years and 35 (58.33%) were female. The rankings of difficulty levels of the nine abbreviations were not different from expectation (Spearman's rho 0.98; p<0.01). The selected terms (CMCTSD, SRL, LSC, SOS, AM, LOL, WHO, USA, UK) were correctly answered 0, 0, 0, 6.67, 13.33, 46.67, 81.67, 96.67, and 98.33 percent, respectively. No individual was able to write down the full term of the three hardest abbreviations. Only 30% correctly stated that AEC was abbreviated for ASEAN Economic Community and therefore considered moderately difficult.

Discussion

While the government of Thailand has been actively promoting and publicizing abundant information about AEC, many people still do not understand even the meaning of it.[6] Findings from the applied innovative and systematic approach used in this study suggest that Thai medical students have limited knowledge about AEC, which was deemed a moderately difficult term. It would not be possible to ask for contributions from a group of stakeholders who mostly does not even understand what the term stands for. Therefore, the current generation of medical students who are directly involved in the movement toward AEC should be better prepared.

Attempts to improve English language skills of Thai students have been successful in grammar and reading ability, whereas speaking and listening skills have remained questionable.[7, 8] Although clinical care requires good interpersonal relationship, which depends partly on understandable communicative language, no clear national strategy to strengthen linguistic skills of medical students have been implemented. The Thai National Licensing Examination has changed the multiple-choice questions of its Step 1 (basic science knowledge) and 2 (clinical knowledge) from Thai to the English language; however, the last step that was aimed to assess clinical practice skills has remained in Thai.[9]

The key limitation of this study is the assumption that language skill can be a proxy for student's comprehension. This study's methodology is similar to the common reading comprehension test that is created to examine language proficiency and test understanding. However, the reading comprehension test is directly influenced by background knowledge of examinees.[7] That is to say, that those being assessed might answer questions correctly without understanding. In our context, it is hard to assume that someone who cannot correctly spell full term abbreviation does not understand the meaning of those abbreviations and vice versa. For example, one might understand what 'NASA' does but could not tell that it stands for National Aeronautics and Space Administration. Also, an abbreviation can represent more than one meaning. Therefore, using language skill to test student's comprehension may not be the best method. [10] As our initial list of abbreviations might be too broad, further study should be conducted to assess the consistency of the findings.

Conclusion

Generalizability of the findings from this study might be limited by background knowledge; however, the objective of this study was to get a better understanding of how medical students of an institution in Thailand understand the term.[11] Hence, further study with larger sample size and in various contexts would be needed.

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Case Report

Detachment of the Amplatzer Device after Interventional Closure of a Mitral Prosthesis Paravalvular Leak

Alexandra Pavel.[1]

Abstract

Background: Paraprosthetic leak is a complication of mitral and aortic valve implantation interventions, that can be treated either through a surgical procedure (repair or replacement of the prosthesis) or by means of a less-invasive percutaneous transcatheter approach. Nevertheless, this percutaneous intervention carries complications on its own, one of them being displacement of the occluder device. **Results:** This is the case of a 66-year-old patient, with a clinical history of two mitral valve replacement procedures, who presented with dyspnea, fatigue, and peripheral edema. Echocardiographic findings described severe mitral regurgitation due to the presence of a paravalvular leak. Considering the high perioperative mortality, renal and respiratory impairment, and the fact that this reoperation would have been the third cardiac surgery for the patient, percutaneous transcatheter closure of the leak was recommended. Four days after the successful procedure, a checkup echocardiogram revealed the migration of the occluder device to the left atrial cavity. Even though the operative risk was high and the prognosis poor, the only available treatment option was the surgical management that achieved the removal of the device and replacement of the diseased prosthesis. **Conclusion:** In conclusion, albeit a less invasive approach, with lower risks and better outcomes, the percutaneous intervention for leak closure has some clinically relevant complications that must be addressed promptly. One of these complications – detachment of the occluder device – even if quite rare, is a significant event that requires immediate surgical or interventional approach. A careful postoperative checkup is therefore essential to detect any complication and to address it directly.

Key Words: Heart Valve Prosthesis Implantation; Prosthesis Failure; Endoleak; Septal Occluder Device; Reoperation (Source: MeSH-NLM).

Introduction

Paravalvular leakage is a relatively rare complication of mitral or aortic replacement procedures and refers to an abnormal passageway between two cardiovascular chambers, which results in the backflow of blood through the space situated between the prosthesis and the valvular annulus.[1] It occurs more frequently after mechanical prosthesis implantation and is more commonly observed in the setting of mitral than aortic valve replacement. Paraprosthetic leaks are often caused by infective endocarditis, fibrosis or calcification of the annulus, that increase the risk of suture dehiscence, or by surgical technical problems leading to inappropriate sealing of the prosthesis to the native annulus.[2] Treatment options for paravalvular leaks are open-heart surgery and the less invasive percutaneous transcatheter closure of the defect. However, reported interventional complications are: access site bleeding, cardiac tamponade, arrhythmias, embolization of the device and prosthetic valve obstruction.[3, 4]

The Case

A 66-year-old man presented with symptoms of congestive heart failure – dyspnea and fatigue during mild activity (New York Heart Association [NYHA] functional class III), swollen legs and ankles, ascites – and a mitral paravalvular leak on the echocardiogram. The patient's clinical history included a previous presentation (2004) for rheumatic mitral valvulopathy, for which he had undergone a mitral mechanical prosthesis implantation, and a reoperation for subacute mitral endocarditis nine years later, when the diseased prosthesis was replaced by another mechanical heart valve; in 2004, simultaneously with the mitral valve replacement, a coronary artery bypass graft surgery was performed, anastomosing left internal mammary artery (LIMA) to the left anterior descending artery (LAD).

At the current presentation (May 2017), transthoracic echocardiography showed mitral prosthetic detachment, with a posterolateral paraprosthetic leak that caused severe mitral regurgitation. Further transthoracic echocardiographic evaluation revealed a severely dilated left atrium, dilated right cavities, mild degenerative aortic stenosis and insufficiency, moderate tricuspid regurgitation and secondary pulmonary artery hypertension; the global ejection fraction was 40%. The patient also had a history of hypertension, atrial fibrillation, and dyslipidemia. Laboratory tests showed a mild anemia with 10.7 g hemoglobin/dL, serum creatinine 1.7 mg/dL and minimal biologic alterations consistent with the cardiac failure (serum urea 78 mg/dL, AST 92 U/L). The patient also suffered from restrictive lung disease with impaired respiratory function. Left-heart coronary angiography showed a functional LIMA to LAD anastomosis and minimal coronary artery disease, except for the left anterior descending artery which was completely occluded proximally.

Given the patient's NYHA class III heart failure and severe mitral regurgitation, but also the capacity of medical therapy of only improving the symptoms without treating the cause, closure of the defect was strongly indicated. [5] The available methods of repairing the defect were either cardiac surgery or percutaneous intervention. Knowing that repeated cardiac surgery is associated with high morbidity and mortality, that a surgical reintervention for prosthesis replacement would be less effective given the presence of valvular endocarditis, but also due to notable advantages of an interventional procedure (shorter hospital stays, early resumption of daily activities, lower risk of complications), the percutaneous leak closure seemed more appropriate.[5] Consequently, the surgical consult concluded that the patient's multiple co-morbidities (chronic kidney disease: eGFR [estimated glomerular filtration rate] = 43 mL/min/1.73m^2, restrictive lung disease [FEV1/FVC ratio = 81% of predicted value]) and high operative mortality (EuroSCORE II = 11.47%) contraindicated the surgical

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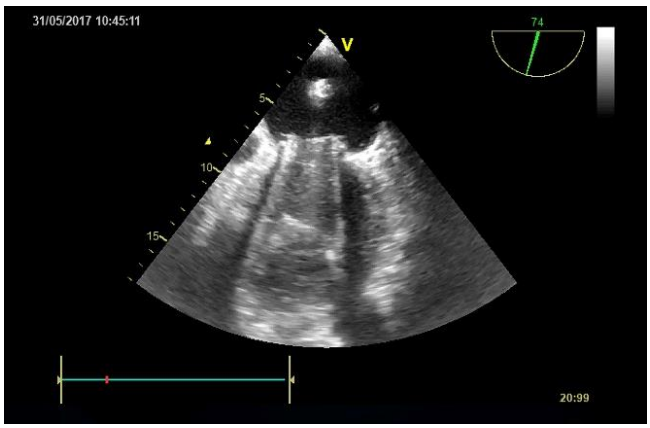
approach, hence prompting to proceed with the percutaneous transcatheter closure.

The intervention was performed with the patient under general anesthesia and with the help of 3-dimensional transesophageal echocardiography monitoring. The selected device for the intervention was The Amplatzer® Vascular Plug III due to the crescentic shape of the paravalvular leak.[3] After the successful deployment of the device at the site, transesophageal echocardiography demonstrated mild lateral paraprosthetic leak and a functional mechanical prosthesis. The patient's recovery was uneventful, except for the fourth post-procedural day, when checkup transthoracic echocardiography revealed a free 10-mm hyperechoic structure floating in the left atrium, consistent with the Amplatzer device dislodged from the deployment place (***Figure 1***).

Figure 1. Transesophageal Echocardiography Revealing the Amplatzer Vascular Plug III Device Floating in the Left Atrium.



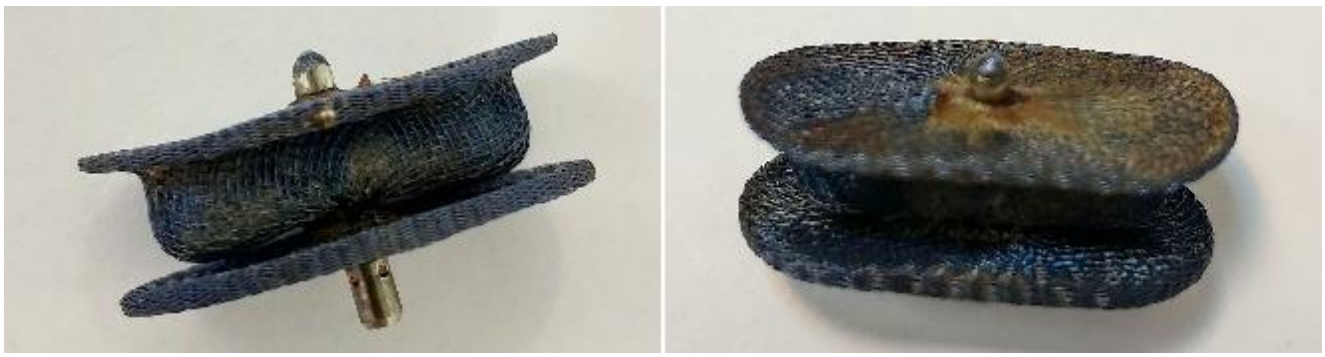
To solve this problem, although the perioperative mortality was high, and the surgical prognosis was poor, the patient's third cardiac surgery was performed. The Amplatzer Vascular Plug III was removed under direct vision (***Figure 2***). A mitral valve replacement was achieved simultaneously using a bioprosthesis; furthermore, the tricuspid valve was repaired through an annuloplasty and an aortic valvuloplasty was performed (shaving cusps' free margins, subcommissural annuloplasties). Therefore, the surgical approach was the best option in the present case, for the following reasons: firstly, the mitral regurgitation could only be solved through a surgical procedure (even if the dislodged device would have been removed in an interventional manner), and secondly, the surgical procedure allowed additional repair of aortic and tricuspid valves. The patient recovered slowly after the reoperation and was discharged 20 days later, hemodynamically and respiratory stable. Seven-month follow-up transthoracic echocardiography showed functional mitral bioprosthesis, with no paraprosthetic leaks, mild biatrial dilation and improved ventricular ejection fraction. No heart failure symptoms were present, and the patient had resumed daily physical activity.

Discussion

Paravalvular leaks are a relatively rare complication of valve replacement procedures, that can be addressed either through surgery or a percutaneous approach. Devices used to achieve an interventional procedure are not specifically designed for paravalvular leak closure, thus the reluctance of applying this method of treatment; however, with respect to the shape and size of the defect, assessed by echocardiography, there are several septal occluder devices available for closure of the paraprosthetic leak.[6] Interventional closure of a paraprosthetic leakage holds several clinically relevant complications: cardiac tamponade can be related to transseptal catheterization or guidewire left ventricular perforation; atrial fibrillation and complete heart block are rare complications that can resolve under medical treatment or pacemaker implantation; prosthetic valve obstruction can almost always be recognized immediately by echocardiography.[5, 7]

Embolization of the device is another post-procedural complication that requires emergent reintervention or cardiac surgery, depending on patient's history, clinical and echocardiographic findings, comorbidities and mortality. Although no large prevalence studies approached this complication, three other cases of device displacement in the setting of mitral paraprosthetic leak closure were reported, where correction was achieved through surgical approach.[4, 8, 9] Another case of mitral paravalvular leakage that was closed with an Amplatzer Plug III device was followed by a late occluder dislodgement; this matter was addressed through another successful interventional procedure.[10]

Figure 2. Amplatzer Vascular Plug III Device after Surgical Removal from the Left Atrial Cavity.



Because of high operative risk, important comorbidities, and given the considerable advantages of the interventional procedure, and suitability for patients with previous cardiac surgical interventions, percutaneous closure of the paravalvular leak was the method of choice in the present case. However, the early detachment of the occluder device had to be addressed through a surgical procedure that allowed not only the repair of the mitral regurgitation but also that of the aortic and tricuspid valves failure.

Although percutaneous closure of a paravalvular leak holds a lower mortality risk than the surgical approach, there are significant post-procedural complications, such as displacement of the occluder device, leading to severe regurgitation, that requires repeated intervention.[4] Therefore, thorough echocardiographic follow-up in patients who had undergone cardiac valve surgery or percutaneous intervention is of paramount importance to ensure an early detection of a possible complication and come up with the most appropriate solution. In addition, one must keep in mind that no intervention is perfect, thus concentrating on choosing the best treatment, according to the patient's specifications, and being prepared for any unwanted effect.

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Case Report

A Case Report Looking at an Incidental Finding of a Partial Anomalous Pulmonary Venous Connection Using Magnetic Resonance Angiography

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Abstract

Background: Partial anomalous pulmonary venous connection (PAPVC) is a rare congenital defect where one or more of the pulmonary veins drain to the right atrium or its tributaries. This can cause a left to right shunt (LTRS) which may need surgical management if symptomatic. **Results:** A 58-year-old female presented in emergency with non-pleuritic, central chest pain. She denied breathlessness and fever. Her past medical history included: non-ST elevated myocardial infarction (2013), anti-phospholipid syndrome, asthma, pulmonary embolism (PE) and deep vein thrombosis many years prior. Differential diagnoses included myocardial infarction, PE and unstable angina. Pulmonary angiography ruled-out PE. Coronary angiography did not show obstructive coronary artery disease. On cardiac MRA an incidental finding of PAPVC was found (left upper pulmonary vein drained into brachiocephalic vein) creating a LTRS which wasn't substantial (Qp/Qs <1.5). Despite being asymptomatic, this patient was followed-up of her incidental finding, and if symptoms developed she would be considered for PAPVC correction surgery. **Conclusion:** This case demonstrated the incidental finding of PAPVC in an otherwise asymptomatic patient. The decision was not for surgery as the patient was not symptomatic from the PAPVC and for follow-up. Previous studies showed PAPVC patients developing symptoms of LTRS are candidates for operation. Physicians should be aware of rare anomalies like PAPVC, their complications if unresolved, and should follow-up these patients closely in case of worsening of the LTRS, in which case surgical correction may be possible. Overall, PAPVC i) can be overlooked ii) diagnosis requires multimodality imaging iii) constant follow up and iv) may be operable.

Key Words: Anomalous Pulmonary Venous Return, Cardiac Magnetic Resonance Angiogram, Pulmonary Vein, Left To Right Shunt, Superior Vena Cava (Source: MeSH-NLM).

Introduction

Partial anomalous pulmonary venous connection (PAPVC) is a congenital anomaly in which one or more of the pulmonary veins drain to the right atrium or its tributaries, instead of the left atrium, causing a left to right shunt (LTRS).[1] The prevalence of incidental PAPVC is 0.1--0.2% and connection of the left upper pulmonary vein to the superior vena cava (SVC) is rare.[1,2-4] PAPVC can have associated congenital anomalies like atrial septal defect and has been reported to be syndromic (e.g. Turner syndrome) in up to 25% of patients.[5-6] In adults, PAPVC can be silent or present with its complications like dyspnea secondary to LTRS. If left undiagnosed, complications such as right ventricular hypertrophy can occur secondary to pulmonary hypertension. Ultimately, this can lead to right sided (RS) overload and RS heart failure.[7,8]

The Case

A 58-year-old female presented to the emergency department with non-pleuritic, central chest pain. She denied any breathlessness and did not report feeling febrile. She had a past medical history significant for a non-ST elevated myocardial infarction (non-STEMI) in 2013 with a drug eluting stent to the syndrome (APS), asthma, pulmonary embolism (PE) and deep vein thrombosis (DVT) many years prior. Furthermore, she was on aspirin due to APS, but no current anticoagulation. Therefore, differential diagnoses included myocardial infarction (MI), PE and unstable angina of which pulmonary angiography ruled-out PE.

Key Points:

- PAPVC is a rare, often silent and can be easily missed which clinicians should be aware of.
- Patients should be followed up closely for development of symptoms or worsening of the LTRS.
- It is very important to systematically review all the data obtained from every imaging modality to prevent missing a potential diagnosis.

Investigation findings showed T wave inversion in leads V2-V5 on EKG and an elevated Troponin T (532 ng/L) confirming an NSTEMI. Therefore, coronary angiogram was immediately performed, showing patent LAD artery stent and moderate (50-60%) stenosis in the mid-right coronary artery (RCA). Cardiac Magnetic Resonance (CMR) was performed, showing preserved LV ejection fraction (LVEF=67%), delayed hyper-enhancement of the septum and apex involving more than 50% of the wall thickness which is consistent with myocardial infarction (MI). On the MRA an anomalous pulmonary venous drainage of the left upper pulmonary vein into the brachiocephalic vein was noted as an incidental finding (***Figure 1***). The LTRS was not substantial as Qp/Qs was < 1.5. (Qp/Qs = 1.3). Her case was discussed in a Cardiology-Cardiothoracic Multidisciplinary Team (MDT) meeting and the decision was not for surgery as the patient was not symptomatic from the PAPVC and to follow up the patient in the cardiology clinic.

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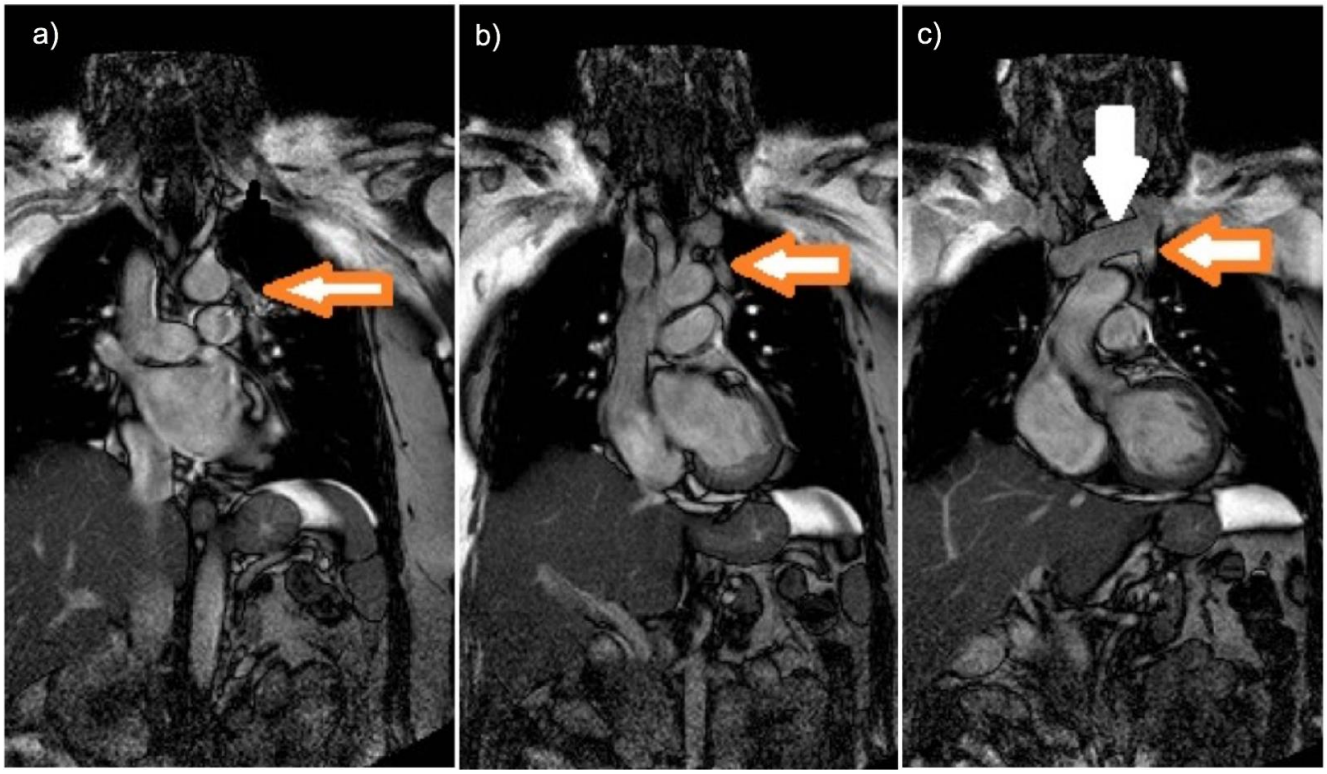
Figure 1. The Patient's Magnetic Resonance Angiogram.



Legend: An MRA Scan Showing (a) An orange arrow points towards the left upper pulmonary vein at the beginning of the anastomosis (b) The orange arrow highlights the middle of the anastomosis between the left upper pulmonary vein and the brachiocephalic vein (c) The arrow is pointing out the left upper pulmonary vein anastomosis with the brachiocephalic vein, marked by the white arrow).

Six months after discharge, the patient was seen in the cardiology clinic and was asymptomatic from the PAPVC, denying any shortness of breath or further chest pain.

Studies have shown asymptomatic PAPVC patients with low post-surgical repair mortality. [13] One study showed that 93% of patients were free from arrhythmia medications at post-surgical follow-up and the remaining 7% had either atrial fibrillation, sinus node dysfunction (SND) or SND ectopic atrial rhythm. [13] Most common surgical risks included getting an arrhythmia, risks of hemorrhage, thrombus, infection, poor tolerance of analgesic methods used and death. However, as these risks are smaller than the risks of untreated PAPVC. Symptomatic patients or those with complications of pulmonary hypertension and right ventricle hypertrophy should be considered for surgical correction to prevent developing a LTRS and eventually RS heart failure.[12-14]

Articles have previously reported diagnosing incidental PAPVC in patients with lung cancer. One patient's PAPVC anatomy mimicked our patient and although asymptomatic, they had increased mean arterial pressure and Qp/Qs ratio > 2.0. [15] Despite a significant co-morbidity of lung cancer, the post-surgical recovery and survival was commendable and supportive of surgery. Despite follow up by cardiologists, some patients were not diagnosed with PAPVC until post CT.[16]

These studies advocate using multimodality imaging to aid diagnosis of PAPVC especially in symptomatic patients with chest symptoms. Ultimately, PAPVC is rare and further research is required showcasing different presentations and ethnic groups.[15-16]

This case highlights incidental PAPVC found on a cardiac MRA performed for assessment of a MI. Our case was discussed in MDT and being asymptomatic from the PAPVC perspective, the decision was not for surgery and to follow the patient in the cardiology outpatient clinic. Symptomatic PAPVC patients can be managed by surgery and repair of the anomalous connection may be performed successfully.

In conclusion, PAPVC is rare, can be fatal and in this case could be easily overlooked as RS heart symptoms were absent. Awareness is crucial as if PAPVC patients become symptomatic, surgical correction may be considered; hence appropriate follow up should be accomplished. Ultimately this case emphasizes the importance of i) advocating relevant multimodality imaging, ii) appropriate patient follow-up iii) and surgical consideration for PAPVC patients who are symptomatic or have developed pulmonary or RS heart complications.

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IJMS INTERNATIONAL JOURNAL of MEDICAL STUDENTS

Letter to the Editor

To Teach is to Learn

Sara Hussain,[1] Sahar Hussain.[2]

The Letter

I am writing this letter in response to your published article titled 'Sixth Class Students' Performance and Confidence Levels Before and After Training in Clinical Skills Laboratories'.[1]

The initial years spent training as a prospective physician are known to be stressful, however, certain measures can be undertaken to make the transition to becoming a clinician less difficult.[2-5] These include more exposure to patients and a working hospital environment, reducing external stressors, and using alternative methods of teaching which may include practical training in clinical skills laboratories, as well as peer assisted learning.[1, 6-10]

We are living in an age of fast paced education, where textbooks are filled with hundreds of years of research that must be instilled into young minds in the most efficient and painless manner possible. While many concepts can be employed to help ease the course of education as mentioned above; studying among and teaching other students who are at the same level of learning is known to be one of the better known and encouraged methods of acquiring knowledge. [11] A study conducted in 2014 compared the free recall between a group of students who were told they would be tested on a topic, and one who were told they would need to teach it to another student. The group that were expecting to teach answered more questions correctly and overall fared better over the second group.[12]

Peer learning, otherwise known as learner centered education, refers to the concept of students learning with and from each other throughout the course of their education. This is usually done without an authoritative figure but may also be the part of a larger class discussion. If done in the correct manner, group studying can result in better learning than conventional methods; group discussions lead to active thinking about material, analysis and discussion of ideas, and therefore a more coherent processing of concepts.

Studying among peers also has the added benefits of developing confidence, critical thinking, communication, and problem-solving skills. Finally, and most importantly, this also develops an insight into self-learning skills, which could potentially become a lifelong asset to develop.[9-11]

While teaching other students it would be wise to keep in mind that not everyone has the same amount of prior knowledge about the topic, so finding a mutual common ground from where information can be built upon is vital. Keeping this in mind, prior research of the chapter beforehand helps to set a framework for the session to come. When planning the group session, a clear and concise plan needs to be arranged for the topics that are to be covered. Topics may be divided or allocated depending on individual preferences, or according to time allocated for study.

During the session itself, various adjuncts of study can be used to facilitate memory and recollection. Mnemonics, pictograms, and diagrams help; but mind maps help keep everyone on the same track throughout the discussion. Repeat often and link thoughts and ideas together while keeping in mind that group study should be a place where understanding the concept behind an idea is the main priority. Information that is *understood* does not need to be *memorized* – it can simply be linked to other ideas and built upon as needed. Additionally, summarizing the knowledge at the end of the session goes a long way towards consolidating the information for a longer period.

Student group studies can also go beyond the theoretical – practical sessions are especially helpful if overseen by a stand-in 'examiner'. This is especially beneficial if practiced on a mannequin, as the session can then be repeated as many times as necessary.[1] Ideas can then be freely shared to improve and enhance the methods of clinical examination.

However, learning does not necessarily have to be a planned and dated arrangement. Spontaneous 'bites' of education are often the easiest to digest and remember. Keeping in mind that not everyone memorizes information the same way – so the goal of the session should be a sharing of knowledge and a place to clear up questions, rather than a final discussion with no revision.

As medicine is always easier to remember by case-based discussion, this can be a good starting point for the learning session and an easy way to link ideas together. Where patient centered learning may not be applicable, question solving can stimulate creative thinking and discussion between peers and may pave the way to finding a rhythm for the learning session.

A classroom where peer learning is advocated and encouraged leads to a more interactive and stimulating learning environment. But while learner centered education can enhance and embellish a teaching session, it should never completely take over a learning institution or method. Teachers always have, and always will be a fundamental part of society, both to oversee and guide young minds towards independent thinking; and to build them as individuals.

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