



Knowledge and attitude of medical students and Young Medical College Teachers towards genetic risk testing for premature coronary artery disease.

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ABSTRACT... Objective: The study was to assess the knowledge and attitude of medical students and young medical college teachers regarding Genetic Risk Testing for Premature Coronary Artery Disease. **Study Design:** Cross Sectional Descriptive study. **Setting:** Azad Jammu and Kashmir Medical College, Muzaffarabad and Combined Military Hospital Muzaffarabad. **Period:** September, 2019 to December, 2019. **Material & Methods:** A self-completion online questionnaire was sent to collect the data from 298 medical students and 70 young medical college teachers (<45 years) at Azad Jammu & Kashmir Medical College, Muzaffarabad, Pakistan and Combined Military Hospital Muzaffarabad. The questionnaire contained questions related to the knowledge and attitudes of the participants towards genetic risk testing along with their views regarding direct to consumer genetic tests for PCAD versus genetic tests involving consultation with a cardiologist before opting for such tests. **Results:** A total of 250 medical students and 62 young medical teachers (<45 years) participated in the study. Only 38% of the students were aware of genetic risk testing while 66% of the medical college teachers had prior knowledge of genetic testing. After being informed about the genetic risk testing for PCAD and its purpose 89% of the students while only 56% of the medical teachers were interested in undergoing genetic risk test for PCAD. The main reason for undergoing the test remained the curiosity to know the predisposition to PCAD amongst the students and the teachers alike while the main reasons for not willing to undergo a genetic test was the cost of the test and the genetic test becoming a worrying factor in the lives of the students while the main reason amongst the medical college teachers was doubt regarding the efficacy and reliability of the test results. **Conclusions:** Although the level of awareness about genetic risk testing is relatively good in young medical college teachers but they are reluctant to advise it or undergo it. Therefore, interventions are necessary to improve its knowledge and utility amongst the teachers and clear their misconceptions.

Key words: Attitude, Genetic Risk Testing, Knowledge, Medical Students, Medical College Teachers, Premature Coronary Artery Disease.

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INTRODUCTION

Genetic risk testing is fast gaining popularity globally.¹ Our research group has previously reported that a cytokine gene score has significant discriminatory ability and potential in the risk prediction of Premature Coronary Artery Disease.² Predictive genetic testing has recently gained attention in Pakistan but the knowledge regarding these tests is limited as are the genetic counselling services.³ Predictive genetic tests aim to identify the genotypes which are at a greater risk of developing diseases such as Diabetes, Cardiovascular diseases, cancer

and some others. Premature Coronary Artery Disease is coronary vessel disease occurring in individuals < 45 years of age which is increasing at a tremendous pace in South Asian countries including Pakistan.⁴ The health care cost related to coronary artery disease in Pakistan has increased tremendously over the past few years.⁵ Genetic risk testing seems to be a promising new method of early disease identification and prevention which can bring down the health care costs especially in developing countries like Pakistan. However, there are multiple school of thoughts as far as the knowledge, attitudes and utility of

these tests is concerned.⁶ While some studies have reported good knowledge regarding these tests amongst the medical students and medical teachers.⁷ Other studies have demonstrated lack of knowledge and positive attitude of young medical professionals towards these tests.⁸ There is lack of studies regarding the knowledge and attitude of medical students and young medical teachers towards genetic risk testing particularly for Premature Coronary Artery Disease in developing countries like Pakistan. There is also dearth of studies assessing the knowledge and attitude of medical students regarding direct to consumer genetic tests in remote areas of Pakistan like Muzaffarabad, Azad Jammu and Kashmir. Hence, our study aims not only to assess the level of awareness regarding genetic risk testing in medical students and teachers but also to identify the main reasons which are hampering the dissemination and acquisition of knowledge regarding genetic testing.

MATERIAL & METHODS

The cross sectional descriptive study was conducted at Azad Jammu and Kashmir Medical College, Muzaffarabad and Combined Military Hospital Muzaffarabad over a period of 3 months from September, 2019 to December, 2019. A self-completion online questionnaire was used to collect data from 250 medical students from year 3 to year 5 of AJK Medical College, Muzaffarabad and from 62 medical college teachers <45 years of age working in the college and its affiliated hospitals over a period of 3 months. Students of first year and second year were excluded as they did not have adequate experience in the clinical sciences as yet. Teachers older than 45 years and those who failed to give consent were excluded from the study. The validated questionnaire⁹ was used with slight modification according to our target population. The questionnaire aimed to assess the knowledge of genetic risk testing for PCAD, interest in undergoing a genetic risk assessment test done for PCAD along with the consent to be informed about the results of the test. The attitudes towards genetic risk testing for PCAD based on personal opinions regarding how religion, beliefs and doubts about one's health can affect the approach towards genetic risk

testing were assessed through multiple choice questions and were then ranked the responses were ranked by the number of times they were selected. Attitude towards undergoing genetic risk testing for PCAD after consultation with the cardiologist as compared to direct to consumer genetic tests was assessed using dichotomous yes-no questions.⁷

Statistical Analysis

Statistical analysis was done using SPSS-22 (SPSS Inc, Chicago). Descriptive analysis was carried out for demographics. Mean and standard deviation were calculated for continuous variables. Categorical variables were compared using chi-square (χ^2 - tests). The answers to multiple choice questions were ranked keeping in view the number of times a particular response was given. A two tailed p-value of <0.05 was considered significant.

RESULTS

A total of 250 medical students from year 3 to year 5 of AJK Medical College, Muzaffarabad and 62 medical college teachers <45 years of age working in the college and its affiliated hospitals participated in the study. The age (mean \pm SD) of the students was 21 ± 3.80 years and that of the teachers was 39 ± 7.8 years respectively. 55% of the participating subjects amongst the students were males while 48% of the subjects amongst the teachers were of the male gender. The response from all the three years of medical students was encouraging and comparable. Detailed demographic characteristics of the participants are shown in Table-I.

PCAD: Premature Coronary Artery Disease; DM: Diabetes Mellitus; DTC: Direct to Consumer; HDL: High Density Lipoprotein; LDL: Low Density Lipoprotein; SD=Standard Deviation; CAD: Coronary Artery Disease; VLDL: Very Low Density Lipoprotein **p<0.01; *p<0.05 Categorical variables were compared using a χ^2 test while continuous variables were compared using independent t-tests.

Only 38% of the students were aware of genetic risk testing while 66% of the medical college

teachers had prior knowledge of genetic testing (Figure-1).

After being informed about the genetic risk testing for PCAD and its purpose 89% of the students while only 43% of the medical teachers were interested in undergoing genetic risk test for PCAD (Figure-2).

The main reason for undergoing the test remained the curiosity to know the predisposition to PCAD amongst the students and the teachers alike while the main reasons for not willing to

undergo a genetic test was the cost of the test and the genetic test becoming a worrying factor in the lives of the students while the main reason amongst the medical college teachers was doubt regarding the efficacy and reliability of the test results (Table-II).

77% of the medical students were ready to undergo direct to consumer genetic risk test for PCAD while only 14% of the medical college teachers were willing to undergo DTC without the consultation of the cardiologist (Table-III).

Parameters	Students n= 250	Teachers n=62	P-Value
Age (y) mean±SD	21 ± 3.80	39 ± 7.8	0.12
Sex (m/f)	138/112	30/32	0.66
Marital status			
Married	12	44	0.303
Unmarried	238	18	
Academic Year n(%)			
3	77 (31)	Not applicable	
4	74 (30)		
5	99 (39)		
Designation			
Demonstrators	Not applicable	48 (77%)	
Assistant Professor		14 (23%)	
Family history HTN n(%)	136 (54%)*	37 (60%)	<0.05
Family history PCAD n(%)	112 (45%)*	18(29%)	<0.05
Family history DM n(%)	78 (31%)*	22 (35%)	<0.05
Family history IHD n(%)	112 (45%)**	20(32%)	<0.01
Knowledge about genetic risk tests for PCAD			
Yes n(%)	95 (38%)	41 (66%)	0.019
No n(%)	155 (62%)	21 (34%)	

Table-I. Baseline characteristics of medical college students (n=250) and teachers (n=62)

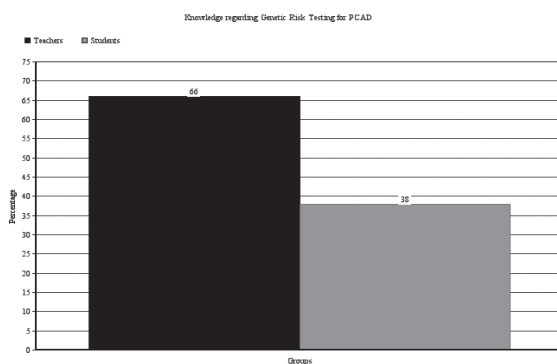


Figure-1. Bar chart showing knowledge about genetic risk testing for PCAD in teachers (n=250) and Students (n=62).

Attitude: Interest in Undergoing a Genetic risk test for PCAD

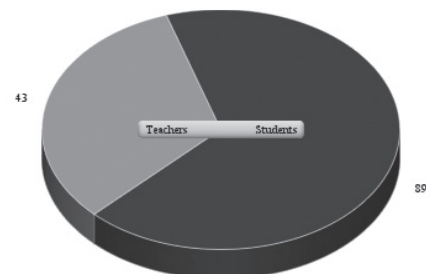


Figure-2. Pie chart showing interest in undergoing a genetic risk test for Premature coronary Artery Disease amongst Medical college teachers (n=62) and students (n=250)

Reasons for Undergoing the Genetic Risk Test	Teachers (N=62) n (%)	Students (N=250) n (%)
Curiosity to know the predisposition to PCAD	45 (73)	189 (76)
Family history of heart disease	20 (32)	112 (45)
Chance of disease being passed on to the future generation	59 (95)	158 (63)
To contribute to the ongoing research on genetic diseases	21 (34)	147 (59)
Family history of hypertension	37 (60)	136 (54)
Interested in finding out about one's genetic traits	56 (90)	212 (85)
No particular reason	12 (19)	45 (18)
Reasons for Not Willing to Undergo Genetic Risk Testing	Teachers (n=62) n (%)	Students (n=250) n (%)
Doubt regarding the efficacy and reliability of the test	57 (92)	98 (39)
Test result causing undue worry	19 (31)	198 (79)
Cost of the test	15 (24)	201 (80)
Being skeptical about genetic risk testing in general	32 (52)	63 (25)
Religious reasons	38 (61)	167(67)
Worried about the privacy of the test results	45 (73)	72(29)
Just not interested	9 (15)	21(8)

Table-II. Participants ranked reasons regarding various aspects of genetic risk testing for PCAD

PCAD: Premature Coronary Artery Disease; n=number of respondents for a particular response; N: Total number of participants

Attitude	Students (n=250)	Teachers (n=62)	P-Value
Attitude: Interest in undergoing a genetic risk test for PCAD with the consultation of the cardiologist n (%)	222 (89%)	35 (56%)	0.001**
Attitude: Interest in undergoing a DTC Genetic risk test for PCAD	193 (77%)	9 (14%)	0.04*
p-value	0.303	0.029	

Table-III. Comparison of interest in undergoing a genetic risk test for PCAD with the consultation of the cardiologist versus a DTC Genetic risk test for PCAD

PCAD=Premature Coronary Artery Disease; DTC=Direct to Consumer; %=percentage; **p<0.01; *p<0.05 by applying Chi-square test

DISCUSSION

Our study shows a considerable level of awareness regarding genetic risk testing for PCAD in medical college teachers in Muzaffarabad, Azad Jammu and Kashmir and a reasonable level of awareness in in medical college students of this region. Since very few studies are available from this region it is encouraging to see that the teachers and students are still aware of the upcoming genetic risk testing techniques. Previous studies have focused more upon assessing the extent of knowledge in medical students about the traditional risk factors for cardiovascular disease.¹⁰ Despite the encouraging response received from our study participants the level of awareness in the participants hailing from the Europe and America is significantly higher than that seen in our region.¹¹ The attitude of the students in undergoing a genetic risk test was much better as compared to the medical college teachers.

Similar results were seen in study conducted by.¹² The teachers despite being more aware of genetic testing were not eager to undergo the test. A previous study has also demonstrated the reluctance of young doctors to deal with matters related to genetic counselling which shows they are not only reluctant to undergo the tests but are unable to guide their patients in this regard as well.¹¹ On the contrary another study reports high level on interest of young physicians in genetic testing but considerable resistance regarding its clinical applicability.¹³ The strength of this study is that to date genetic risk testing has not been introduced in the clinical settings in Pakistan and the reasons for this are vague. Genetic risk testing holds a pivotal position in the near future and will become the need of the hour therefore it is essential to get to the bottom of the reasons hampering its use in our region. Moreover, our young doctors and the medical students are the

future of the healthcare sector of our country. Therefore, they are the first in line to be educated regarding genetic risk testing and it is extremely important to clarify any misconceptions that they have so that they can educate their patients also. The sample size of the study should further be increased and doctors and students from diverse backgrounds and from different regions should be included in the study to broaden the horizon.

CONCLUSIONS



The medical students and teachers make an important part of the society and their knowledge and attitude regarding the genetic risk tests will influence the level of interest of the patients and their attendants regarding genetic screening for early detection and prevention of Premature heart disease.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Wafa Omer	Concept, design of study, sample collection, Data entry, Data analysis, Drafting, Final review, data analysis, Critical appraisal, manuscript drafting.	
2	Omer Jamshed Khan	Drafting, Sample collection, Final review, manuscript drafting, Data analysis.	
3	Ejaz Hassan Khan	Drafting, Final review, data analysis, revision.	