

Student's perspective about pharmacogenomic applications and knowledge in pharmacovigilance domain

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ABSTRACT

Background: Pharmacogenomics has its presence now in all major pharmacology text books parallel with another important chapter pharmacovigilance. Pharmacogenomics apart from therapeutic application it can greatly influence standard treatment protocols with prevention of adverse drug reaction. Since the future will be physicians practicing personalized medicine, this study was planned to assess the second year M.B.B.S Students knowledge and their perspective about pharmacogenomic application.

Methods: A questionnaire to assess the knowledge about pharmacogenomics and current status of its application is formulated with yes or no, true or false option. The study was conducted on 120 M.B.B.S Students who passed out Pharmacology university exams. The questionnaires answered voluntarily were collected and the data was analysed and with results calculated in percentage.

Results: 80% M.B.B.S students had sound knowledge about pharmacogenomics. 100% M.B.B.S student's doctors were well aware about pharmacogenomics. 13.0% of students were not aware but wanted to know about it, while 7.25% of students were neither aware nor interested about pharmacogenomics.

Conclusions: Most of the doctors were aware about the pharmacogenomics theoretically and they need to be updated about its clinical application in their practice by seminars, presentation and workshops.

Keywords: Awareness, Doctors, Pharmacogenomics, Personalized medicine

INTRODUCTION

The dose of most of the drug to produce the similar biological activity could differ by 4-6 folds among different individuals and in same individual at different circumstances.

Many factors play a key role in drug biological activity which includes transporters, metabolizing enzymes, ion channels, receptors with their couplers and signal transduction mechanism are controlled genetically. Due to which individual drug response variability can be traced to the genetic composition of the subject.

The study of genetic basis for variability in drug response is called 'Pharmacogenetics'. This deals with genetic influences on drug action as well as on drug handling by the body. Pharmacogenomics is the use of genetic information to guide the choice of drug and dose on an individual basis.¹

Pharmacovigilance has been defined by the World Health Organization (2002) as the 'science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug related problems.' The information generated by pharmacovigilance is useful in educating doctors about Adverse Drug Reactions and in

the official regulation of drug use.² The main purpose is to reduce the risk of drug-related harm to the patient. It has an important role in the rational use of medicines, as it provides the basis for assessing safety of medicines.³ Pharmacogenomic information about an individual and clinical interpretation application and skills if available, the physicians can predict and prevent possible adverse effect and enhance drug effectiveness for the benefit of the recipient. Hence the present study is designed with questions to identify the student doctor's knowledge and perspective about pharmacogenomic application in pharmacovigilance domain.

METHODS

The study participants are 120 second year MBBS students and participation was voluntary, conducted in Department of Pharmacology IRT-PMC, Sanatorium (post), Perundurai, Erode, Tamilnadu. Prior permission obtained from appropriate authority in department of pharmacology and approval from department medical education unit. The survey questioner to assess the knowledge about pharmacogenomics and current status of its application in pharmacovigilance and personalized medicine is formulated with yes or no, true or false option.

The questioner filled by the students was analysed for the answers provided by participants and for given ten questions marks were awarded with 1 mark for each question and graded as follows

Grading according to marks⁴

The Questioner was scrutinized and inferred as follows;

- >8 well aware about pharmacogenomics and its clinical application in pharmacovigilance domain.
- 6-8 well aware about pharmacogenomics but not its clinical application in pharmacovigilance domain.
- 3-5 not aware about pharmacogenomics and pharmacovigilance but willing to know.
- <3 not aware about pharmacogenomics and pharmacovigilance and not interested.

From the marks obtained each survey is inferred with above guidelines and were tabulated for statistically analysis.

The study was conducted on 58 M.B.B.S Students from 2015 batch and 62 M.B.B.S Students from 2016 batch. The questionnaires answered voluntarily were collected and the data was analysed and with results calculated in percentage. The study period was about 3 months from June 2016 to august 2016.

Statistical analysis

The collected data were segregated and entered in MS excel for statistical analyses and data was summarized as percentage.

RESULTS

The total of 118 M.B.B.S students of 2013 and 2014 batch was provided with the questionnaire out of which 110 participated which included 22 male students and 31 female students of 2013 batch and 31 male students and 27 female students of 2014 batch (Table 1).

Table 1: Student's strength and gender distribution.

Student batch	Student gender	
	Male	Female
2013	22	30
2014	27	31
Total	110	

The analysis of results exhibited 80% M.B.B.S students had sound knowledge about pharmacogenomics. 100% M.B.B.S student's doctors were well aware about pharmacogenomics. 13.0% of students were not aware but wanted to know about it, while 7.25% of students were neither aware nor interested about pharmacogenomics. 12% did not participate in the survey (Figure 1).

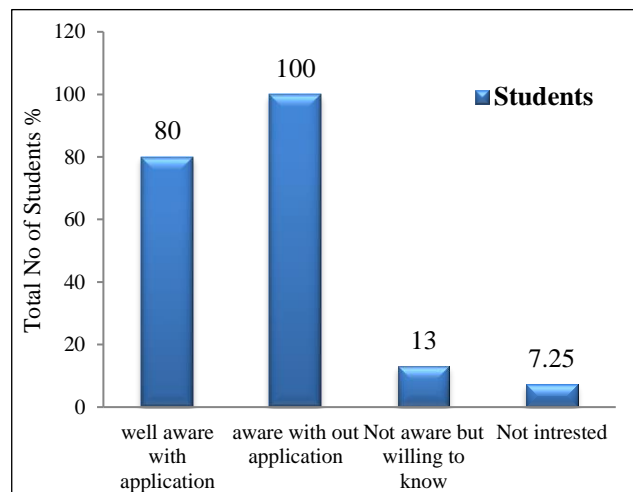


Figure 1: Extent of awareness among students.

DISCUSSION

The Department of pharmacology under its General Pharmacology teaching module has incorporated Pharmacogenomics application and under adverse drug reaction about Pharmacovigilance and its activities. Pharmacovigilance as early detection and prevention tool of adverse drug reaction with available pharmacogenomic data and student doctors understanding the fact that genotyping of the individual needs to be done only once the concept of personalized medicine patient care can be achieved.⁵ The present study survey report analysed 80% of the students are aware of pharmacogenomics knowledge and its clinical application and use in pharmacovigilance but still it's the cognitive domain strengthening but achieve and developed as skill in their routine day to day clinical use they should have exposure

at clinical posting to practically see such clinical applications in specialty departments which uplifts the confidence in using pharmacogenomics as a tool for their drug therapy decision-making even though they are well aware theoretically about it.⁶ According to analysis 100% of the students were aware about pharmacogenomics but not its application which proves theoretical knowledge alone is insufficient the student should see practical application of what learnt bed side teaching at learning.

From the survey 13.5% of students were not aware but wanted to know about it, while 7.25% of students were neither aware nor interested about pharmacogenomics which clearly explain the few student's perspective that they see that it's an advance science of future and no place in current clinical application. But right now, for example simple spot test like G-6 PD deficiency are currently in use.⁷

The study by Kudzi W et al, on faculty members in health training institutions in Ghana, when surveyed about their knowledge of pharmacogenomics, found 6.3% excellent, 9.4% very good, 28.1% good, 37.5% fair and 18.8% as poor.⁸ Such huge difference in knowledge and awareness among present student and faculty members is because of pharmacology teaching curriculum has incorporated pharmacogenomics and pharmacovigilance in its teaching module globally.

Pharmacogenomic as a tool is applied to identify individuals who are either more likely or less likely to benefit from the administered drug, as well as those who response and to predict the best treatment option.⁹ This is possible only by upcoming doctors who could apply the knowledge at large to patients with known genetic abnormalities, which would lead to the goal personalized medicine.¹⁰

But still the practical application in routine patient care is at present limited due to pre-requirement of multiple drug specific genotypic screening.¹¹

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