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Original Research Article

Knowledge attitude and practices of pharmacogenomics and its educational needs among doctors at a tertiary care hospital VIMS, Ballari: a questionnaire based study

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ABSTRACT

Background: Genetic differences account for an outsized amount of patient variation in drug response and disposition. Pharmacogenomics is that the study of genetic factors that underlie variation in drug response. The objective of the study was to assess the knowledge, attitude, and practices of pharmacogenomics and its educational needs among doctors of a tertiary care teaching hospital in Vijayanagar Institute of Medical Sciences, Ballari.

Methods: A cross-sectional survey was conducted among 110 doctors forming a structured questionnaire.

Results: Nearly 82.8% of the survey participants were of the age group 25 to 34 years. When choosing appropriate drug therapy for patients, medical record and age were the factors most commonly cited by respondents as extremely or vital (98%). When asked to rank their familiarity with pharmacogenomics, 40% reported somewhat familiar with the subject. 98% of respondents found pharmacogenomic information in drug labelling extremely/very/somewhat helpful. 48.4% of participants knew that drug metabolizing enzymes were the foremost commonly recognized mechanism for pharmacogenomic differences in drug response. The foremost common reasons for not ordering weren't knowing what test to order (48%). The most common pharmacogenomic resource consulted by survey participants were internet (80%), scientific literature (50%), and medical association literature (30%). The most common preferred formats for a perfect pharmacogenomic resource were indicated as web-based (60%), mobile application (60%), and print materials (34%).

Conclusions: There's a requirement for improved resource material preferably in electronic format to extend the appliance of genomics to clinical care.

Keywords: Pharmacogenomics, Knowledge, Attitude, Practices

INTRODUCTION

Pharmacogenomics is that the study of genetic factors that underlie variation in drug response.¹ Genetic structure of individuals causes pharmacokinetic and pharmacodynamic variations. Application of pharmacogenomics to clinical care can increase the efficacy and safety of medicine. Pharmacogenomics has become an area of great potential within the medical profession.

Therefore, the assessment of the knowledge and attitudes among healthcare professionals is important.² Despite there is gap in reported knowledge by health care providers less attention has been paid on pharmacogenomics.³

US Food and Drug Administration has introduced pharmacogenomic information in drug labeling for quite 200 drugs. With the arrival of personalized medicine, the

application of pharmacogenomics to clinical care is increasing. However, the formal training of doctors in pharmacogenomics is less within the school of medicine. Hence, it's important to assess the knowledge, attitude, and practices of pharmacogenomics and its educational needs among doctors during a tertiary care hospital. The aim of the study was to assess the knowledge, attitude, and practices of pharmacogenomics and its educational needs among doctors at a tertiary care hospital Vijayanagar Institute of Medical Sciences (VIMS), Ballari.

METHODS

A prospective cross-sectional survey was conducted among 110 doctors at VIMS a tertiary care hospital during a period of one month (January 2020) to possess an insight into their knowledge, attitude, and practices regarding pharmacogenomics, using a structured questionnaire. The study was performed after getting approval from the Institutional ethics panel. The collected data were analyzed using descriptive statistics and the info were analyzed for the subsequent parameters - study group characteristics, knowledge of pharmacogenomics, pharmacogenomics test ordering, current and ideal pharmacogenomic source.

Inclusion criteria

Doctors working within the hospital were included within the study.

Exclusion criteria

Those who were not willing to participate were excluded from the study.

Data entry and analysis was done using Microsoft office excel 2010.

RESULTS

Nearly 82.8% of the survey participants were of the age group 25–34 years. 54.54% of the respondents were working in medicine and allied specialties. 79% of the respondents used smartphone and laptop to access health-care-related information (Table 1).

When choosing appropriate drug therapy for patients, medical history and age were the factors most ordinarily cited by respondents as extremely or vital (98%) followed by adverse effects (49%), labeled indication (36%), and genetic information (28%). Genetic information was considered less important by the bulk (Figure 1). 98% of respondents found pharmacogenomic information in drug labeling extremely/very/somewhat helpful. 48.4% of participants knew that drug metabolizing enzymes were the foremost commonly recognized mechanism for pharmacogenomic differences in drug response.

Table 1: Characteristics of survey population (n=110).

Characteristics	Total respondents (%)
Age (in years)	
25-34	82.8
35-44	15.45
45-54	1.81
Specialty	
Medicine and allied	54.54
Surgery and allied	22.72
General Practitioners	22.72
Devices used to access health care related information	
Smart phone	79
Laptop	79
Desktop computer	40
Table computer	25

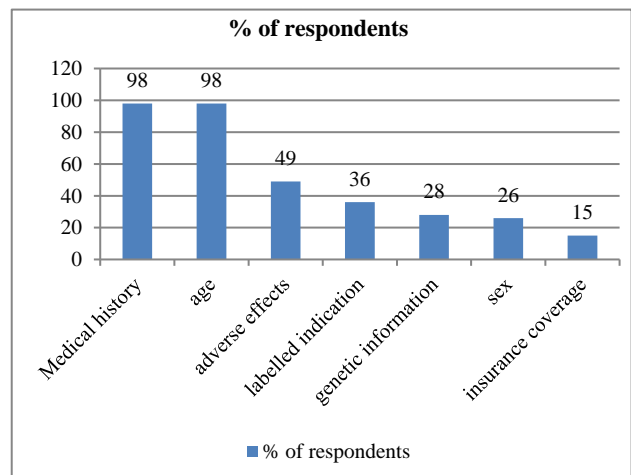


Figure 1: Factors cited as extremely or very important by respondents when choosing appropriate drug therapy

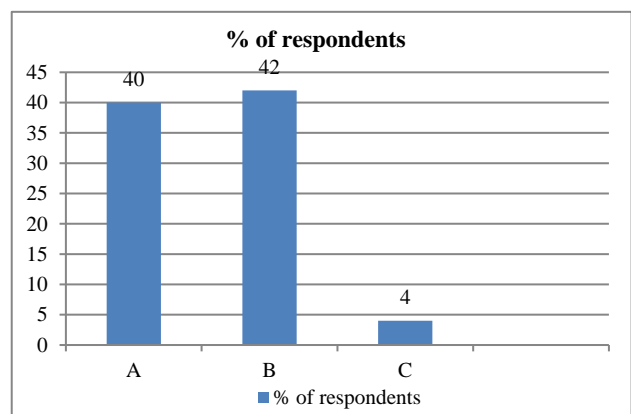


Figure 2: (A) Somewhat familiar with pharmacogenomics; (B) strongly or somewhat agree that I am confident in my knowledge about the influence of genetics on drug therapy; (C) have had formal training in pharmacogenomics.

Only 4% of survey respondents had ordered a pharmacogenomic test last year. 33% anticipated ordering a pharmacogenomic test next year (Figure 2).

Table 2: Resources currently consulted when questions arise about pharmacogenomics.

Resources	Total respondents (N)
Internet	80
Scientific literature	50
Medical association literature or guidelines or recommendations	30
Peer discussion	24
Drug labelling	12
FDA website	10
others	14
Do currently available resources enable you to access the pharmacogenomic information you need to or want to know	Yes- 96 No-14

Table 3: Preferred characteristics for an ideal pharmacogenomic resource.

Characteristics	Total respondents (n=110)
Content	
How to interpret pharmacogenomic test results	69
Effect of genetic variation on the mechanism of drug action	64
Recommendations for prescribing	48
Description of pharmacogenomic information in drug labelling	58
List of laboratories offering testing	38
References such as scientific literature	26
Demographics of populations likely to carry variations	24
Format of ideal resource	
Web based	60
Mobile application	60
Pop up reminders within prescribing system	36
Print materials	34
Incorporated with electronic medical record	14

Current pharmacogenomic resources consulted by respondents are described in Table 2. Concepts of a perfect pharmacogenomic resource are described in Table 3. Reasons most commonly cited by physician respondents for not ordering a pharmacogenomic test within the past year, and for not anticipating ordering

a pharmacogenomic test within the next year are shown in Figure 3.

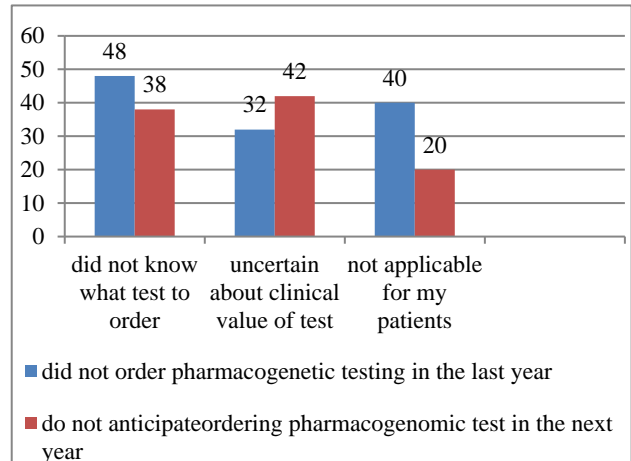


Figure 3: Reasons most commonly cited by physician respondents for not ordering a pharmacogenomic test in the past year, and for not anticipating ordering a pharmacogenomic test in the next year.

DISCUSSION

The results of our study like other studies suggest a scarcity of familiarity in pharmacogenomic knowledge and practices among respondents. Although about 42% of respondents considered themselves to be familiar and assured in their knowledge of pharmacogenomics, genetic information was considered important by only a minority (28%) while prescribing.

Nearly 98% of respondents found pharmacogenomic information in drug labeling extremely or very or somewhat helpful. 86% of the clinicians and ten of the postgraduates agreed or strongly agreed that they're conscious of labeling regulation of pharmacogenomics in drug packages.⁴ Less than half the respondents (48.4%) were conscious of the essential fact that enzymes were the foremost common mechanism for pharmacogenomic drug responses. Majority of respondents (98%) had not ordered even one pharmacogenomic test during last year citing the rationale that they weren't knowing what test to be ordered. These lacks of data were mainly due to a scarcity of formal training. Only 4% had undergone formal training as a part of continuing medical education schemes. A study done by Kudzi et al in Ghana revealed that 97.6% of the doctors were of the opinion that pharmacogenomics should be included in their continuing professional education training.⁵ A survey done on US physicians by Stanek et al revealed that the majority of the physicians weren't well informed on the clinical utility of tests.⁶

This study found that only 17% had received information on pharmacogenomics during their graduate training. Haga et al found that the important concerns for not ordering genomic risk profiling by medical care

physicians within the US were uncertain clinical utility, the danger of disability, the potential for discrimination, confidentiality, and cost.⁷ Like other studies, we found that the respondents are not completely satisfied with current genomic education resources. A resource in electronic format which incorporates components like interpretation of pharmacogenomic test, the effect of genetics on drug action, and outline of same in drug label was considered to be a perfect one. Taber et al did a survey within the US which revealed that more than 75% of respondents used smartphone or computer to access health-care-related information.⁸ Ya'u et al did a scientific review of data, attitude, and practice toward pharmacogenomics among doctors.⁹ 14 out of 15 systematic reviews revealed limited knowledge as a barrier to adopt pharmacogenomics into practice.

Study limitations

Our study had a little sample size. There was an overrepresentation of the physicians belonging to the younger age group.

CONCLUSION

The use of the pharmacogenomic test is low. There's a need for improved resource material preferably in electronic format to extend the appliance of genomics to clinical care. There's a scarcity of formal training during this subject, and it has to tend more emphasis within the undergraduate medical curriculum. More Continuing Medical education schemes have to be conducted on pharmacogenomics.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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