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Original Research Article

Impact of educational session on knowledge and attitude towards teratogenicity among undergraduate medical students: a comparative study

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ABSTRACT

Background: Teratogenicity is a major cause of abortion, still birth and can result in longterm disability with a significant impact on individuals, families, societies and healthcare systems. Drugs being one of the causes of teratogenicity, creating awareness among medical students, the future prescribing physicians, the rate of teratogenicity can be decreased. The objective was to compare the attitude and knowledge about teratogenicity among the medical undergraduates before and after an educational session on teratogenicity.

Methods: A pre-validated semi structured questionnaire on attitude and knowledge about teratogenicity was distributed to 2^{nd} year medical students (147) before and after teratogenicity educational session. Results obtained were compared within the group. Paired t test was used for within the group comparison. P-Value <0.05 was considered to be statistically significant.

Results: Improvement in knowledge showed statistically significant improvement following teratogenicity educational session (P-Value=0.0003). Improvement was there in post session attitude scores as well, however, it was not significant (P-Value=0.64).

Conclusions: Early reinforcement about teratogenicity in medical students enables them to decide appropriate drug therapy while prescribing for females of reproductive age group.

Keywords: Knowledge, Teratogenicity, Undergraduate medical students

INTRODUCTION

Teratogenicity is defined as "any morphological, behavioral or biochemical effect induced during embryonic life or fetal life detected at birth or later". 1.2 The term teratogen is originated from a Greek word 'teras' meaning a monster. A number of factors like infections (TORCH), ionizing radiation, metabolic disturbances (diabetes mellitus and phenylketonuria) and drugs act like a teratogen. Teratogenicity is a major cause of abortion, still birth and can result in longterm disability with a

significant impact on individuals, families, societies, and healthcare systems.⁴

WHO had estimated 2,70,000 deaths during the first 28 days of life to be due to congenital anomalies globally. March of Dimes (MOD) global report on birth defects stated 7.9 million births (0.6% of total births) to be associated with serious birth defects annually. Majority (94%) of these defects occur in middle and low income countries. Joint WHO and MOD meeting reported birth defect to account for 7% of all neonatal mortality and 3.3 million under five deaths. Common birth defects include

congenital heart disease, congenital deafness and neural tube defect.⁵

India being a high birth rate country the annual birth defect prevalence of 6-7% can significantly affect many health indicators. ^{5,6} Teratogenicity is an important cause of fetal birth defect leading to neonatal morbidity and mortality still awareness about teratogenicity is found to be inadequate among physicians. ^{7,8} Teratogenic drugs are responsible for <1% of birth defects. ⁹ Previous studies had reported only 24% of physicians to be confident while prescribing for a pregnant woman. ¹⁰ During pregnancy 59% of women are prescribed with drugs other than vitamin and mineral supplements. ⁹ Category D drugs were used in 0.41% to 23% and category X drugs were used in 0 to 2.9% of the cases during pregnancy. ^{7,11}

There is a need for the early exposure of students to the concept of teratogenicity which will bridge the gap in their knowledge as well as which will lay the foundation for safe prescribing for a pregnant woman. Thus, creating awareness through early educational intervention among undergraduate medical students, the future physicians, is necessary to decrease the incidence of preventable teratogenicity. Hence the present study is taken up.

The objective of this study was to compare the knowledge and attitude towards teratogenicity among undergraduates before and after an educational session on teratogenicity.

METHODS

This was a questionnaire based comparative study carried out at Kempegowda Institute of Medical Sciences (KIMS), Bangalore over a period of 3 months from 15th January 2017 to 15th April 2017. The inclusion criteria were (i) second year MBBS students (ii) students studying at KIMS. The exclusion criteria were (i) students not willing to participate in the study (ii) dental and physiotherapy students. With prior approval from Institutional Ethics Committee, a pre-validated semi-structured questionnaire comprising of questions on knowledge and attitude towards teratogenicity was used as a tool. This questionnaire was divided in 3 sections. Section 1 had questions on the demographic details of the students: age and gender. Section 2 assessed the participant's knowledge by using a set of semi-structured questions and the results were expressed as percentages. Section 3 of the questionnaire assessed the student's attitude towards teratogenicity and the results were expressed as percentages. After obtaining informed consent the questionnaire was distributed among the participating students and the response was obtained. The assessment of their performance was based on the scores (0 = wrong)response and 1 =correct response). This was followed by an educational session with power point presentation. The topic comprised of various aspects of teratogenicity including its causative factors, vulnerable period, outcome and category of teratogenic drugs. Later post-lecture response to the same questionnaire was taken from the participants. The results were analyzed and compared using paired t-test (P<0.05 was considered significant). Descriptive statistics was used wherever required.

RESULTS

A total of 147 second year MBBS undergraduate students participated in the study. The response rate was 100%.

Table 1: Demographic characteristics of subjects.

Total	Age (in years) *	Gender		
		Female (%)	Male (%)	
147	19.93±0.78	84 (57.14)	63 (42.86)	

^{*}Age in years is expressed as mean±SD.

Table 1 shows the demographic data of the students who participated in the study. Majority of the students were female. Mean age of the participating students was 19.93 years.

Table 2: Knowledge and attitude towards teratogenicity.

Questions	Number of correct response* (%)	
Are you aware of the term teratogenicity	147 (100)	
What are the causes of teratogenicity	99 (67.35)	
Do you think all the drugs are safe during pregnancy	146 (99.32)	
Teratogenicity due to drugs can occuduring all the trimesters	ar 86 (58.5)	
What are the results/outcomes of teratogenicity	116 (78.91)	
Do you think teratogenic defects can be diagnosed during pregnancy	121(82.31)	
Do you think teratogenic defect has to be present at birth	82 (55.78)	
Are you aware of US-FDA fetal risk categories	51 (34.69)	
Definition of category A drugs	93 (63.27)	
Definition of category X drugs	101(68.71)	
1st known drug teratogen	40 (27.21)	
Name of any two teratogenic drugs	36 (24.49)	
Name of two teratogenic defects associated with drugs	20 (13.61)	
Do you think folic acid can prevent neural tube defect	136 (92.52)	

^{*}Pre-session response

Table 2 summarizes the pre-session knowledge and attitude scores of medical students on various aspects of teratogenicity. All of the students were aware of the term teratogenicity. Most of the students (67.35%) had the knowledge of all the causes of teratogenicity. Majority of the participants (99.32%) believed all the drugs are not safe during pregnancy. Only 58.5% were aware that drugs can act as a teratogen throughout the pregnancy. Various

outcomes of teratogenicity were known to most of the (78.91%) of the participants. Only 34.69% were aware of 'US-FDA fetal risk categories' though 63.27% and 68.71% of the participants chose correct response for category A and category X drugs respectively. Majority of them (82.31%) believed that a teratogenic defect can be diagnosed during the pregnancy. Most of the participants (55.78%) had the perception that the defect has to be present in the newborn at the time of the birth. Only 27.21% were aware that 'thalidomide' is the first known drug teratogen. Majority of the students (75.51%) did not know the name of any two teratogenic drugs and 86.39 % were unable to name any two drugs associated teratogenic defects. However majority of the students (92.52%) believed that maternal folic acid supplementation can prevent neural tube defect in the fetus.

Table 3: Comparison of mean pre-session and postsession knowledge score.

Parameter	Pre-session (mean±SD)	Post-session (mean±SD)	t	p- Value*
Knowledge score	5.37±2.126	8.44±1.869	5.68	0.0003

^{*}p-value statistically significant at <0.05

Table 3 shows the comparison between the pre-session and post-session scores for the knowledge about teratogenicity among the students. The mean value of 8.44 in the post-session group was higher than that in the pre-session group (5.37). The improvement in the knowledge score of post-session group was statistically significant (P-Value=0.0003).

Table 4: Comparison of mean pre-session and postsession attitude score.

Parameter		Post-session (mean±SD)	t	P- Value*
Attitude score	3.30 ±0.953	3.61 ±0.735	2.09	0.64

^{*}p-value statistically significant at < 0.05

Table 4 shows the comparison of pre-session and post-session attitude scores among the students. The mean value of attitude score was higher in the post-session group (3.61) as compared to the pre-session group (3.30). However, this improvement in the attitude scores during post-session was not statistically significant (P-Value =0.64).

DISCUSSION

Considering the burden which a teratogenic defect can bring to the patients, their family and the preventable nature of these defects, awareness regarding teratogenicity among the medical students is necessary.¹²

In our study, all of the students who were approached to participate in the study gave their consent for participation and majority of the participants were female. The response rate of 100% was suggestive of students' willingness to acquire the knowledge about teratogenicity. Similar results were seen in previous studies done among the undergraduate medical students. ^{13,14}

Most of the participants were aware of the multifactorial causation of the teratogenicity. Majority had the knowledge that a teratogenic defect can lead to various morbidity as well as mortality in the fetus/newborn. Most of the students thought that these defects can be diagnosed during the pregnancy. However the belief that the defects in the newborn have to be present at the time of birth, which was more prevalent among the participants, was wrong.

Though most of our study subjects believed that all drugs are not safe during pregnancy, lesser number of them was aware that a drug can be teratogenic throughout the pregnancy. A total of 63.27% and 68.71% of the participants chose correct answer for the definition of category A and category X drugs respectively however only 34.69% were aware of complete US-FDA fetal risk categories. Only 27.21% mentioned thalidomide as the first known drug teratogen in the human beings. Most of the students did not know the names of any two teratogenic drugs and even higher number of them did not know any two associated defects.

However, majority believed that maternal folic acid supplementation can prevent fetal neural tube defect. The knowledge regarding teratogenic drugs was inadequate. The results were similar to previous studies done among the physicians.^{7,10,15}

To the best of our knowledge similar studies among second year medical students have not been done previously.

When compared to the pre-session score there was a significant improvement in the post-session knowledge scores indicating the impact of educational session and scope for improvement with the early intervention among the students. ¹⁶

The limitations of our study were that of small sample size of students of same academic year of a single institution. There was only one educational session. Long term impact of educational session was not measured. In future, further studies can be done with large sample size with subjects representing different education level assessing both immediate as well as long term impact.

CONCLUSION

Post-session improvement in knowledge score emphasizes the need for early exposure of medical students to the concept of teratogenicity. Multiple exposures on these aspects will help the students in the future to decide the safe drug for a pregnant woman.

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Institutional Ethics Committee

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