

# Study of innovative changes made in curriculum of biochemistry for first year MBBS and its relation to its effect on university examination

Dhananjay V Bhale\*, Ajit Shroff\*\*, P M Jadhav\*\*\*

\* Professor and HOD, Department of Biochemistry, MGMMC, Aurangabad, Member B.O.S. and Academic council MGMIHS, Navi Mumbai, Maharashtra, INDIA.

\*\* Dean, MGM MC, Aurangabad, Faculty Dean, and Member Academic council MGMIHS, Navi Mumbai, Maharashtra, INDIA.

\*\*\* Member B.O.M. and Academic council MGMIHS, Navi Mumbai, Maharashtra, INDIA.

Email: [dr.bhale@gmail.com](mailto:dr.bhale@gmail.com)

## Abstract

**Aims and objectives:** To study effect of innovative changes made in curriculum of Biochemistry subject of first year M.B.B.S. students by MGM institute of Health Sciences and its relation to effect on learning abilities of the students in terms of final result of Biochemistry in First M.B.B.S. University examination conducted by M.G.M. Institute of Health sciences, Navi Mumbai. **Material and Methods:** This prospective study was undertaken in Department of Biochemistry, MGM'S Medical College, Aurangabad. Total 700 students from 7 batches from 2008 to 2014 were taken for study. We studied average of passing percentage of batches of First M.B.B.S. students in last 07 years and studied the effects of curriculum changes made in syllabus of Biochemistry with the final university results of the students. **Observations and Results:** In our study we compared results of the batches in whom innovative changes in curriculum of Biochemistry were done by MGM Institute of health sciences with the earlier batches in which the innovative changes were not made. The mean average result of batches in whom innovative changes were made was  $84.1 \pm 4.94$  in comparison to  $75.6 \pm 4.24$  in the batches in whom curriculum changes were not made. The difference is statistically significant. **Conclusion:** This shows that innovative changes in Biochemistry such as inclusion of case studies on Liver function tests, Kidney function tests, Lipid profile in practical, principles of recent techniques and introduction to advanced instruments such as autoanalyser, chemiluminescence immunoassay technique in clinical laboratory to First M.B.B.S. students helps in better understanding of clinicobiochemical correlation of topics and effectively dispensing of teaching learning process including emphasis on student centric methods such as problem based learning and outcome of the students passing rate of university examination is consistently good. This has been shown by average passing rate above 80 % consistently from last 04 years university results which are definitely correlating to innovative changes made in Biochemistry curriculum of first M.B.B.S. by MGMIHS and its successful implementation by Department of Biochemistry, MGM Medical college, Aurangabad.

**Keywords:** biochemistry, First year MBBS student.

## \*Address for Correspondence:

Dr. Dhananjay V Bhale, Professor and HOD, Department of Biochemistry, MGMMC, Aurangabad, Maharashtra, INDIA.

Email: [dr.bhale@gmail.com](mailto:dr.bhale@gmail.com)

Received Date: 08/08/2015 Revised Date: 02/09/2015 Accepted Date: 13/09/2015

## Access this article online

Quick Response Code:	Website: <a href="http://www.statperson.com">www.statperson.com</a>
	DOI: 16 February 2016

## INTRODUCTION

One of the principal objectives of medical education is to produce medical personnel having sound clinical competence and community orientation with proficient communication skills. A combination of these qualities is necessary to solve the formidable health problems<sup>1</sup>. However, there is a general dissatisfaction with the prevailing medical practices and one of the main reasons for such dissatisfaction has been identified as the present day medical curricula. This puts a tremendous responsibility on the institutions providing medical education for bringing about the required innovations in the existing systems to meet the defined needs of the

societies in their areas of operation.<sup>2,3</sup> Medical Council of India has stressed upon 1 Community oriented 2 Need-based curriculum,<sup>3</sup> Stimulate student’s interest and 4. Inculcate drive to learn more mainly through an active self-directed approach rather than through didactic teaching. Biochemistry Curriculum should have A. Small-group approach, to enable the students to learn concepts of small-group dynamics and teamwork; B. Problem-based approach, to enable them to find answers to biomedical problems through self-directed learning and use of appropriate resource materials. C. Thoroughly integrated and to the extent possible problem-based, the curriculum incorporates organ-system pattern and encompasses all parameters outlined in the SPICES model<sup>4,5,6</sup>.

### MATERIAL AND METHODS

This prospective study was undertaken in Department of Biochemistry, MGM’S Medical college, Aurangabad. Total 700 students from last 07 batches from 2008 to 2014 were taken for study. We have studied the university results of Biochemistry of students appeared in first year University examination of batches from year 2011, 2012, 2013 and 2014 who were exposed to changes in curriculum of Biochemistry and also from 2008 to 2010 with regular curriculum without changes. The results were compared with those of students from batches 2008,2009 and 2010 whom were following regular syllabus having no innovative changes. We studied average of passing percentage in Biochemistry of batches of First M.B.B.S. students in last 07 years and studied the effects of curriculum changes made in

syllabus of Biochemistry with the final university examination results of the students related to Biochemistry.

**Table 1:** Showing academic yearwise distribution of groups of students appearing in final university examination

Sr No.	Group	Academic year
1	Group A	2011 to 2014
2	Group B	2008 to 2010

**Table 2:** Showing distribution of group showing innovative changes made in curriculum of Biochemistry by MGMIHS

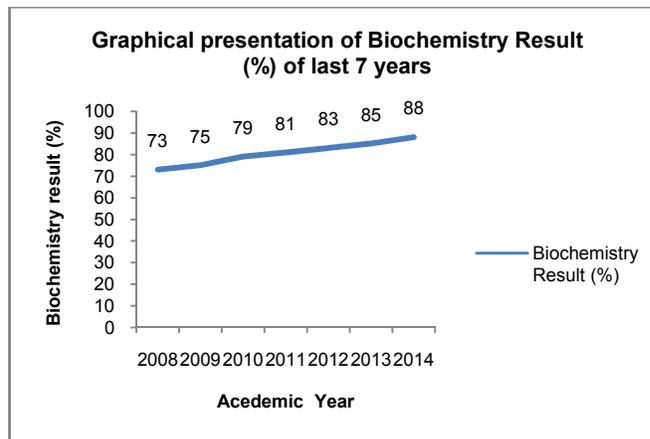
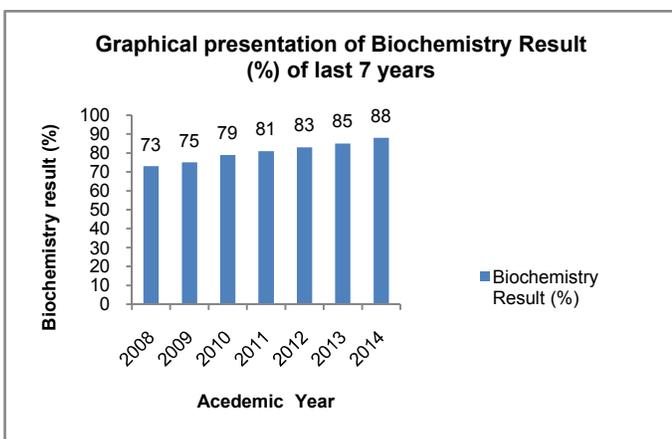
Sr No.	Group	Changes in curriculum made
1	Group A	Yes
2	Group B	No

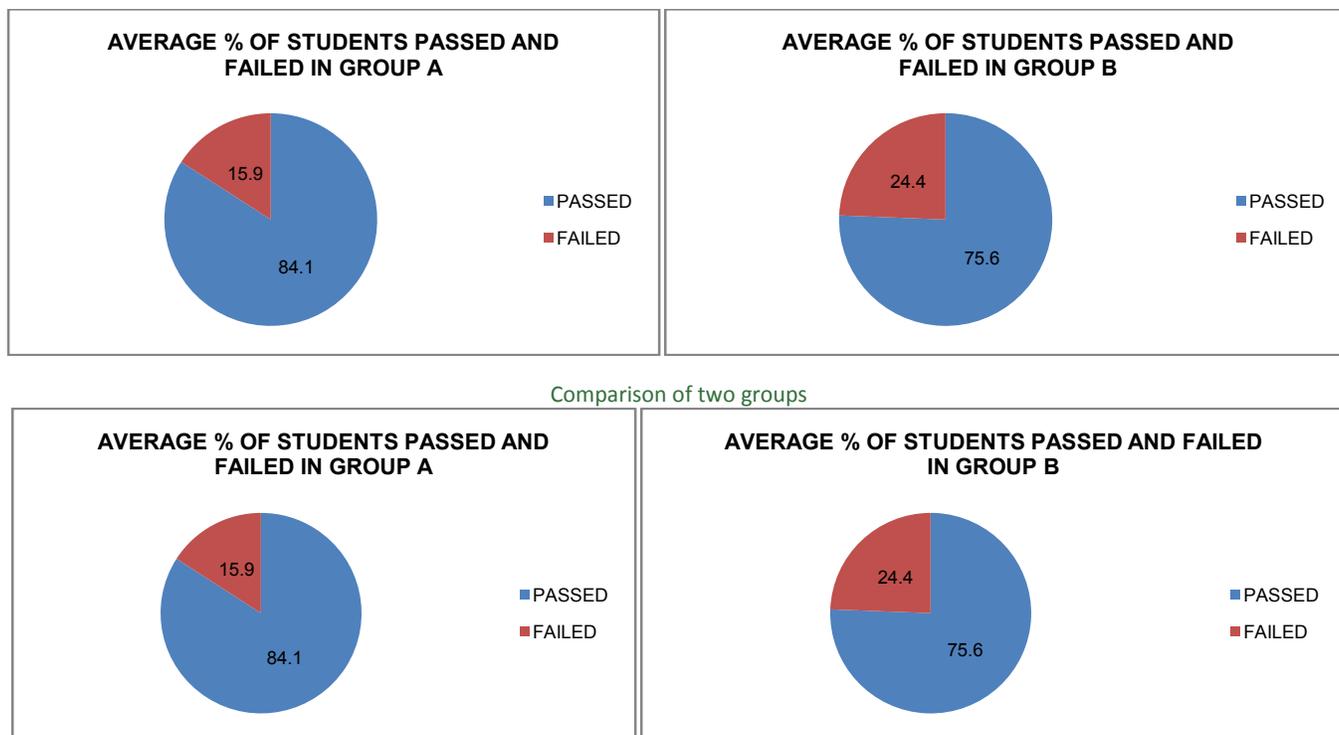
**Table 3:** Average % of yearwise Biochemistry result

Sr. No.	Year	Result
1	2008	73
2	2009	75
3	2010	79
4	2011	81
5	2012	83
6	2013	85
7	2014	88

**Table 4:** Showing comparison of average percentage result of successful candidate appeared in first M.B.B.S. university examination in Biochemistry in a Group A and Group B. The result is extremely statistically significant

Sr. No.	Group	Means±S.D.	P value
1	Group A	84.1 ± 4.94	<0.0001
2	Group B	75.6 ± 4.24	





## RESULTS

Table 3 shows Percentage of Biochemistry subjectwise result in First M.B.B.S. University examination since last 07 years in MGM Medical college, Aurangabad. We found average percentage result of successful candidates appeared in first M.B.B.S. University examination in Biochemistry in Group A was  $84.1 \pm 4.94$  and in Group B was  $75.6 \pm 4.24$ . The difference of mean results in Group A was higher as compared to group B and was extremely statistically significant. This shows that there is definite positive effect of innovative changes made in Biochemistry syllabus with success rate of the students appearing for university examination in Biochemistry. (Table 4)

## DISCUSSION

This study was undertaken in Department of Biochemistry, MGM Medical college, Aurangabad from period of 2008 to 2014. We divided the students in two groups Group A and Group B. The students from 2011 to 2014 who were exposed to innovative changes in biochemistry curriculum developed by MGMIHS, Navi Mumbai and implemented successfully by department of Biochemistry, MGM Medical college, Aurangabad were included in Group A as study group and they were compared with Group B not exposed to changes in curriculum. The changes in syllabus were suggested in Board of studies then forwarded to academic council and finally approved by board of management. These changes

were effectively dispensed in teaching learning process including student centric methods such as problem based learning i.e. case studies throughout the academic year of respective batches at MGM Medical college, Aurangabad. The self-directed organ based teaching is supplemented by problem-based exercises, which have been recognized as effective integrated approach to learning medicine through real and simulated health problems. The problem base orientation was given to this new curriculum in view of reports that medical knowledge cannot be considered in isolation from the process of problem solving and that student led discussion groups are superior in learning complex material in term of memory retention<sup>8,9</sup>.

### Innovative changes done in curriculum of biochemistry of first M.B.B.S

The key incorporation in curriculum of Biochemistry for first M.B.B.S. in recent times have been pertaining to topics of global relevance such as inclusion of Lipid profile and introduction to immunoassay technique as L.C.D. topics. We started compulsory exposure of 07 days to clinical Biochemistry laboratory to first MBBS students so that they can get knowledge of various biochemical tests carried out on autoanalyser and their principles by recent methods. Addition of glucose oxidase peroxidase method along with conventional Folin wu method for teaching practical of estimation of blood glucose level has been done as Folin wu method is nowadays obsolete from clinical laboratory practice.

Addition of demonstration of Urine sugar by uristick method along with Benedicts test. Previously we were having 05 questions of one mark each for spotting in practical examination. Previously we used to ask principles of qualitative tests and uses of reagents and of conventional instruments. This question has been changed by university to each of 01 mark case study based on various organ function tests, interpretation and normal ranges and their correlation to various diseases. We have added case studies on liver function tests, kidney function tests, lipid profile, meningitis, diabetic ketoacidosis, multiple myeloma etc. This helps the students to learn and use their critical thinking abilities to solve the problems such as case studies asked in practical examination spot. Problem-based approach, to enable them to find answers to biomedical problems through self-directed learning and use of appropriate resource materials. Integrated teaching with Physiology and Anatomy. For example Biochemistry would aim to teach mechanism of hormone action, second messengers, hormone receptors etc, Physiology will teach biological effects of individual hormones, Anatomy will teach structure of endocrine gland secreting these hormones. Efforts of these disciplines are in coordination to achieve thorough understanding of that topic by students. Thus the organ system represents an integrated approach to learning medicine, which has been reported to be an effective means of imparting medical education and a viable alternative to the traditional curriculum based on disciplines.<sup>7,8</sup>

## CONCLUSION

This study shows that at the end of first M.B.B.S. teaching programme the students can correlate clinicobiochemical correlation better with various

diseases and that promotes better learning and understanding of biochemical basis of medicine due to innovative changes in curriculum such as problem based learning and integrated teaching. This in turn affects on the overall performance as well in final university examination results of Biochemistry students. This has been shown by average passing rate above 80 % in Biochemistry consistently from last 04 years in university examinations.

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Source of Support: None Declared  
Conflict of Interest: None Declared