

SERVICE LABORATORY AS LEARNING TOOL

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ABSTRACT

BACKGROUND

Student's perception has been studied for three years on the problem-related issues in relation to microbiology of the MBBS course. Existence of confusion associated with the subject is not unfounded.

MATERIALS AND METHODS

Questionnaire was supplied for quantitative as well as qualitative analysis to extract the answer on the perplexing problem in various areas of microbiology, regularly faced by the students during the examination of 2nd professional MBBS course.

Analysis- More than 80% of students found the subject unusual, different and difficult to remember and so reproduce. The various aspects of microbes in the nature, life cycles of parasites and immunological normalcy and in disease were most difficult to remember, as analysed.

RESULTS

Though the qualitative and quantitative analysis on specific question based study is not encouraging, the examination result being broad based, has been satisfactory from the point of view of success in passing the course.

CONCLUSION

Unless the subject is planned also in a different manner, the students might continue to live in confusion. Need of the hour is therefore in depth analysis of the course curriculum in the light of objectives laid down by MCI for the MBBS course.

KEYWORDS

Problem, Confusion, Reproduction, Zoonosis, Culture, Service Laboratories, Etc.

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BACKGROUND

Microbiology is primarily the knowledge of microbes. No other subject in medical degree course has such high degree of variety at undergraduate level like microbiology. Role of animals, birds, insects, soil, temperature, water, etc. make microbiology different from other subjects. Viability of the microbes in artificial culture media, its morphology, growth characters of varying nature make the field of study unusually different in contrast to other subjects.

An attached relationship is established and maintained when the subject of study is inside the human body and creates a natural interest to medical undergraduates. So, it is primarily a different knowledge in case of microbiology as only the effects of attacks by these tiny microbes create natural interest like other subjects. Consequence of lesser attachment and interest makes the subject less caring and more detached. Further consequence is observed in the examinations when many students cannot fit the description in correct matter and score is affected. Study of vectors,

vehicles and intermediate hosts^{1,2,3} prior to human infection are further unusual different chapters, not so exhaustively experienced in other subjects of the course. So, it is the study of animals, environment to later effect human being. Considering the magnitude, most national health programs are microbiology based that continue to throw light on its importance for the entire community.

MATERIALS AND METHODS

Both quantitative and qualitative study were carried out for 3 years from 2013 to 2015. Questionnaire was designed in simplified manner to seek student's reaction on microbiology with all its constituent components. 88% of students were of the opinion that microbiology was most problematic to remember and reproduce in spite of repeated reading. Difficulty and confusion was recorded by 67% of students regarding immunology, 62% on virology and 49% on parasitology. In specific question section, 66% opined on confusion on life cycles of the parasites, 56% of students opined that colony characters of growth in culture media vary for each bacterium and was difficult to remember the difference in morphology. 48% of students opined wrongly on the method of sterilisation of MacConkey's Agar, 61% could not write correct answer about blood agar preparation. 78% answered that blood agar was used for haemolysis, 52% could not answer all types of haemolysis. Specific question section was very important for qualitative analysis to assess as to how much of accuracy existed. These answers are expected to be known in 3rd and 4th semester.

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All these above, could be answered correctly if they would observe the preparations of the media in the service laboratory. 42% could answer about concentration of agar and its origin and function. Answer on viruses were viral as 31% could answer classification of DNA and RNA viruses and morphology.

Major immunology related questions on specific areas were answered by 49% of students of 5th semester. Most students could broadly answer on immunity, serological basis of tests and could not answer many 'must know areas.' Mycological growth on culture is so vivid, beautiful and coloured that cannot be forgotten in a lifetime. On the question on *Aspergillus fumigatus*, *Candida*, the students could not answer how it looked like in culture. The theory classes teach on the growth characters, but the students lacked opportunity to observe. 56% of students answered about the name of culture media for fungal growth and also KOH mount, lactophenol cotton blue, etc., but they have not seen all these though available in the setup. There exists a gap between the material taught in theory classes and the observational experience. So, visit to the service laboratory could have translated the existing theory knowledge to a lifetime experience through the tubes of unforgettable colours. The author even faced question from students on whether the lactophenol cotton blue was a blue cotton. The question prompted many similar questions and tagged the value and importance of visit to service laboratory to find answers before undergoing evaluation in semester and final examination. Students could be activated enormously by reading the resistance and sensitivity pattern of the causative bacteria in the petri dish of the service laboratory and would correlate the mechanism of resistance through sex pilus in the genetics. On question on biomedical wastes, 60% could write the use of yellow, blue and red bucket. 62% of students could write the name of common disinfectants and mixed up the answers when asked on specific usage. The contact period for disinfection could be answered by 22% of students. On concentration of disinfectants to be used, 14% could answer correctly. This area is of paramount importance to be practiced regularly in hospital and laboratory setup. Disease diagnosis are taught at length, but the disposal safety is often neglected on category wise disposal and prior disinfection. This risky area can be easily remembered if they observed the disposal particularly in microbiology service laboratories. Multiplied growth in culture media being most infectious, demand thorough observation from handling to isolation, identification, etc. How this amplified growth of infectious agents are being managed is a never forgettable experience, which can be acquired if the attention is focused. Reading any number of times may not succeed, but reading once and seeing the procedure would paste the knowledge in systematic manner. There is no substitute to the evidence. Clinical case taking of many other subjects make the subject natural and interesting. So, likewise, visit to service laboratories can be adjusted with the practical part can be equated with the clinical case taking.

DISCUSSION

According to MCI,⁴ the objectives framed for microbiology are very clear in relation to knowledge to be acquired and skills to be developed at the end of the course. The students of the course need to interpret the investigations for the diagnosis of infectious diseases. They need to identify the common infectious agents with the assistance of laboratory procedures. Sterilisation and disinfection⁵ being the processes of asepsis and antisepsis should be thoroughly understood from the point of view of choice of method for correct application. The study indicates that there exists probable gap in between the knowledge to be imparted and development of skill. Firstly, the need for learning microbiology is to be realised. Realisation comes only when the magnitude of problem is understood and learning process is made interesting. Variety in teaching process can develop interest on why they should observe, perform and attain a holistic approach towards finding out the causes. The modification if carried out would improve memory and retention, which environmental conditions are responsible for the existence, persistence, growth and spread of the microbes are to be analysed to add to the knowledge. The adaptation of the microbes in soil and vegetation to grow as infective form is unique and these events make the study interesting. The virulence factors of the microbes need in depth study as these factors are responsible for the human pathogenicity.

Few related subjects have double the strength of faculties.⁴ There exists subject that has one theory paper as per syllabus. So, the volume of study is automatically distributed and also lessened. Most areas of microbiology are not seen by the students except bacteriology and parasitology. So, all these areas are needed to be read and remembered by high degree of imagination and recapitulation, which appears genuinely difficult for the students of undergraduate course. Zoonotic microbiology⁶ and entomology⁷ also need to be understood to realise the routes of infection and the modes of transmission to the patients, contacts and the community. Because of such type of vastness, microbiology has been included in general colleges too and medical students need to palpate the magnitude.

End result of non-observation in the service laboratories is that they read and try to remember with extra effort. The extra effort would naturally decrease if the students are scheduled to observe the procedures in the service laboratory. Then, it gets inscribed and easy to remember and reproduce during examination. The answer scripts and viva voice examination provide valuable qualitative information for analysis on performance.

The universal precautions, its importance on self-safety, patient safety and disposal safety cannot be better evaluated, then microbiology. Construction, destruction and disposal bear the processing of highly infectious clinical specimens. Collection, reception, separation, handling followed by transportation, processing, etc. demand the need of practice of universal blood and body fluid precaution. The scientifically articulated practice of gloves,

gown, goggles, gumboot, cap, mask and plastic buckets is a chain system if breached, broken can lead to disastrous consequence. The knowledge starts from microbiology and disseminate to various organs of the hospital to keep infections under control on hourly basis. The students need to know why microbiology department plays the pivotal role on safe practice for the entire hospital including regular sterility checks. Sterility allows any hospital-based department to function after obtaining sterility-related report on degree of contamination or the absence of it particularly OTs, ICU, dresses, instruments, etc. penetration on the knowledge of microbes can keep maintain a healthcare institution. Microbiology appears as invisible service to maintain the visible hospital services and the degree of importance lies in any act in the hospital.

It is noteworthy to understand that the students visiting service laboratories, if planned, deliver better. Learning and delivery depends on many other factors like type and quality of students, type and quality of teachers of the subject and topic of the subject whether interesting. By nature, student maybe intelligent, attentive or non-attentive, maybe regular or irregular type, maybe agile or lazy type. He may not fully understand the procedure, may not be able to grip. He may not be physically sound or mentally fit. The degree of his present status may not be enough to understand and remember systematically. He may be affected by his or some family problem. So, it is required to consider, analyse and rectify different types of such students to extend assistance. The type and quality of teacher, hour of the class, etc. are also important to generate, create interest and consequent absorption by the students. An approachable teacher shall be approached for solving the problem faced beyond the class hour too. The author is of the view that a teacher needs to be open, friendly and needs to show interest to solve query by the needy student. Here lies the shine of relationship that would always enrich and augment for a brighter student's career, an attachment grown beyond any boundary for life.

All these above are mostly general needs, but affect the degree of learning. Extraction of clinical interest from a para-

clinical subject is a challenging task for students, teacher and the institution.

SUGGESTION

1. Thrust maybe on certain specific areas of microbiology pertaining to application of microbial knowledge for medicine and allied surgery and allied subjects for scoring in future examinations as well.
2. Blue print of infectious process from animals to human, vectors to human, its origin to insertion in the human body maybe planted or the table like building design instead of wall hangings only.
3. Planned coverage of objective as spelt out by MCI maybe adhered to by making modification of available practical hours.
4. Appointment of faculties and other staff maybe thought about for any modification of MCI's minimum staffing strength.
5. Blood collection and immunisation centres maybe included for stimulation.
6. Visit to veterinary college and hospital can act as interesting dose on zoonotic aspects, so is diary, slaughter house and water treatment plant.

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