Knowledge towards Biochemical Parameters of COVID–19 amongst First Professional Year Medicine Students: A Cross-sectional Study

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

The latest pandemic coronavirus disease (COVID-19) has been linked with mounting morbidity and mortality and this has shocked the existence of the world-wide population. Human activities and acquaintance of the biochemical parameters in medical students during the crisis is important so that they can transmit the correct information to the society. A cross-sectional questionnaire study was conducted in students of first professional year of medicine. An online validated questionnaire was posted. This was followed by a lecture on the same topic and then a post test to assess the gain in knowledge was conducted on the students.100 students participated in this learning endeavour. Most respondents had good acquaintance about the corona virus infection and its associated sign and symptoms. They were conscious of particulars like the contributory factors of COVID-19 disease (91%), the causative factors (92.7%) ,and the precautionary measures to be taken like washing of hands and wearing the face mask. The knowledge regarding the changes in biochemical parameters CRP , LDH , ferritin, procalcitonin, D-dimer in COVID-19 was better in the post test Such interventions should be a part of the learning process in the initial phases of medical education since it will act to generate a human resource in health care during the pandemic.

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1. INTRODUCTION

The COVID-19 pandemic due to the SARS-CoV-2 virus had its inception in Wuhan, China in December 2019, probably as a result of cross-species transmission [1] affecting practically every country on the planet, causing largely moderate symptoms of the respiratory tract in which the majority was an infection of the upper portion of the tract [2,3] The reason why some people become seriously ill while others do not is still a mystery. For risk stratification, co-morbidities and laboratory indicators have been proposed [4,5].

The COVID-19 epidemic has resulted in a global lack of healthcare resources, and INDIA is no exception. Substantial data from undergraduate sciences including medical, pharmaceutical, dental, physiotherapy and nursing colleges can be used in this situation. In the event of a pandemic, laboratory biochemical markers to foretell the severity of COVID-19 are critical because resource distribution must be meticulously designed, particularly in the background of information which is to be given to the doctors working in the COVID wards and also the treatment which is to be rendered to the patients.

The biochemical markers analysed for prognosis in COVID-19 are serum C-reactive protein (CRP), Lactate dehydrogenase (LDH), D-Dimer, Procalcitonin (PCT) and Ferritin.

Students studying medicine are either directly or indirectly involved in epidemics and pandemics. Despite their lack of expertise managing patients or appropriately using personal protective equipment, they have been questioned by many in their surroundings regarding COVID-19 situation. They are the prospective physicians, who will focus on the community and society in totality, becoming responsible and acting as a epitome for society by their acts and deeds. Because blood routine parameters were considerably varied between non-severe and severe COVID-19 individuals, they were determined to provide critical information for disease severity. With the introduction of competency based medical education, knowledge of the students especially in the first year of their graduation toward the changes in the biochemical parameters is essential since they also deal with other parameters and understand the basic concept of biochemical parameters in various diseases. Though large amount of information is accessible on social media with respect to changes in the biochemical parameters with infection progression in COVID-19, it would be appropriate to impart the knowledge to the students in the initial year itself.

Hence, knowledge regarding the same in this first year students of basic science will be of immense help so that they can be an element of the treatment protocols and practices by obtaining patient case histories, diagnosing patients with laboratory results, collecting samples, tutoring patients, enlisting visits, and solving inquiries about the disease to their family, relatives, and neighbours, and increasing the efficiency of understaffed clinics [4]. This will facilitate an initial proactive management and help in designing an educational initiative plan of action. Moreover it will generate an interest in understanding the pathogenesis of the disease and also will imbibe a long-term retention of knowledge regarding the subject.

For this reason, the current study was carried out to assess the knowledge of first year MBBS students regarding the biochemical parameter and related biochemistry in COVID-19.

2. MATERIALS AND METHODS

An e-cross-sectional questionnaire study was carried out among 150 first year medical students of N.K.P. SIMS & RC Nagpur. After consent was received from the participants the validated questionnaire was sent through E-mails and WhatsApp to the first year professional medical students. Once the link was clicked, the respondents got access to the information and questionnaire of the study. Students who did not consent for the same were excluded. A pre-test was initially conducted to assess the knowledge of the first year professional students regarding biochemical parameters in COVID -19. A lecture on the same was given after the pre- test and a post test was taken with same questionnaire. The data obtained was analyzed for number and percentage through Microsoft Excel version 10.

3. RESULTS

Out of 150 students, 100 students (66.66%) participated in this study. The evaluation of those
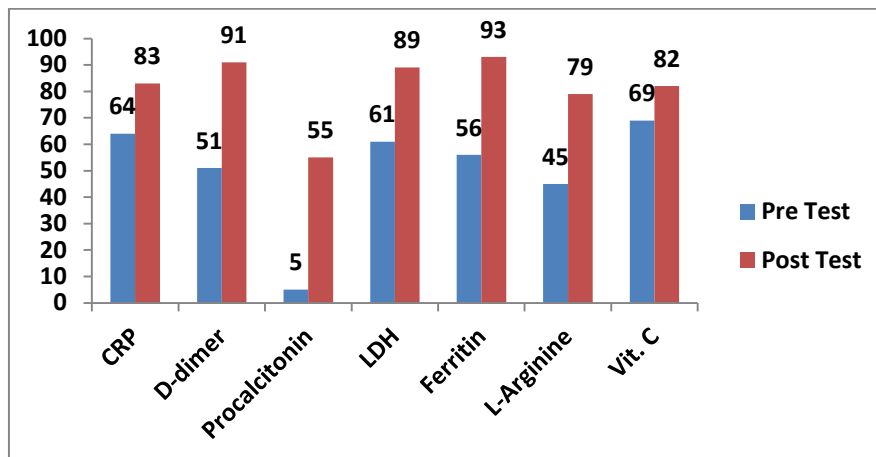
Fig. 1. Knowledge of biochemical parameters in first year MBBS students

100 students has been summarised in Fig. 1. Most respondents had good acquaintance about the infection and the associated sign and symptoms of the virus. They were conscious of details like the contributory aspects for the COVID-19 disease (91%), the causative factors (92.7%), the isolation period (95%) and the precautionary measures like washing hands and wearing of face mask.

The knowledge of the students regarding minimum concentration of alcohol in hand sanitizer was almost the same in pre-test and post test. About 20% were aware about the sensitivity of RT-PCR test before lecture which turned to 85% in post test. The causative virus is a single stranded RNA which is responsible for COVID-19, was known to 66% of the students. 97% of them later on got to know the answer on delivery of the lecture. The spike of corona virus is made up of a glycoprotein was known to 63% of the students. On delivery of the lecture this increased to 92%.Average 65% students were aware of normal ranges of LDH and CRP before lecture and it was about 85% post lecture, so there is improvement in knowledge about biochemical parameter post lecture in this student.

As in Fig. 1, 51% students were aware of D-Dimer test in COVID-19 patient is used to detect tendency to form Clot which was 91% post lecture. The parameter which is more useful to know severity and prognosis of COVID-19 patient is pro-calciton in and only 5% students were aware of that which is improved to 55% after lecture. About 45% students were aware of use of L- arginine amino acid as nutritional supplement to boost immunity / lung function in

COVID–19 patients. About 44% student had pre-knowledge that corona vaccine activate acquired Active Immunity.

4. DISCUSSION

Many people's health has been damaged by the global epidemic COVID-19. World Health Organization (WHO) has labelled this pandemic disease outbreak first in third week of March 2020. Healthcare machinery are placed under tremendous stress during pandemics and a scarcity of health-care worker (HCW) can lead to the participation of less experienced HCW, such as first year professional medicine students in helping the existing task force. Additionally, medical students are usually consulted for healthcare suggestions and biochemical report analysis from their known relations. This is because they tend to have a better knowledge than students of allied science branches when the health management issues [4,6] are considered. It is a known fact that this knowledge is more in medical students in their later stages of studies [7]. So, the current study was carried out to assess the knowledge of first year MBBS students regarding the biochemical parameter and related biochemistry in COVID-19.

Laboratory biochemical markers predicting an adverse outcome in COVID-19 tend to include raised levels of parameters in serum like D-Dimer, CRP, PCT and ferritin. According to the present evidence, cut off points for each biochemical investigation carried out for the prognosis has been documented and higher cut-off levels may indicate a worse prognosis. In COVID-19, serum CRP could be utilised not only as a prognostic measure, but also to track

disease progression. Although more research is needed, elevated serum PCT may help physician in prescribing appropriate antibiotic therapy for bacterial super infection. Regardless of the severity of the clinical presentation, patients with COVID-19 who have considerably increased D-dimer levels may require hospitalisation. In the absence of contraindications, all hospitalised COVID-19 patients should receive a prophylactic dosage of an anticoagulant.

In our study, first year medical students were conscious of details like the contributing factors of the corona disease (95.6%) and also the virus responsible for causing infection (92.7%). This is in agreement with a latest study from our neighbouring country i.e Pakistan [8], in which maximum students, (97.4%) were having knowledge of the same. Maheshwari S et al. also had similar findings of (92.7%) causative factors and precautionary measures of the disease [9]. The reason for this might be the easy accessibility of information through the electronic and social media about the disease.

We also found the good knowledge in student about normal ranges of some biochemical parameter like LDH (61%) and CRP (64%). In this study we found that the participants were having comparitively lesser knowledge than expected regarding the mechanism leading to changes of biochemical parameters in COVID-19. Only 5% participants knew that procalciton in is used to assess severity and prognosis of COVID -19 patients, 56% had knowledge about ferritin parameter , 51% had knowledge about D – dimer test used but after lecture we found that there was improvement in knowledge which was assessed by taking post test . As far as our knowledge is concerned we did not find any study which ascertained the knowledge of first year students regarding.

In our study, 68% of participants have responded correctly about the treatment modality of corona virus which is good but somewhat lesser in percentage. A similar study has been documented from Italy, where 80.7% of participants answered the same correctly [10]. In pre test only 26% answered correctly about use Low molecular weight heparin in COVID -19 which was improved to 80% in post test. These are the arenas where education can be reinforced and a better level of knowledge which can be transmitted to the first professional students and thus can fill in the lacunae of knowledge related to COVID-19. This could in a way provide additional hands in the form of first year students in this COVID-19 pandemic.

The study's biggest disadvantage is that it can only provide an overview of the knowledge of the students because we did not receive a 100% response rate, which prevented us from presenting definite conclusions.

5. CONCLUSION

Our study showed that there is good acquaintance about the pandemic of COVID-19 among first year professional medical students. Majority (90%) of the students had appropriate knowledge regarding the causative strain of the virus causing COVID-19. Also the usage of protective mask against the virus, frequent hand washing, maintaining social distancing and self – quarantine aspects were known to the students. Surprisingly, lacunaes in knowledge were noted in few areas like biochemical parameter and biochemistry of disease. These should be identified and taught to the students through an educational program like lectures. In our study this was undertaken and evaluated through a post test. This concept of updating the students is the need of the hour and needs to incorporated at the initial level of their entry into the medical college.

ETHICAL APPROVAL

Permission was obtained from the Institutional Ethics Committee (IEC-pharmacology/7/2021 dated 28/5/2021).

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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