

To evaluate the validity of Manchester Triage System in emergency care for the patients during COVID-19 outbreak: A prospective observational study

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COVID-19 pandemic is now affecting the whole world and every new patient is a potential source of COVID infection. In this situation, it is a challenge to identify and segregate the suspected COVID patient and the

non COVID patient so that mixing of COVID and non COVID patient can be avoided. So it becomes necessary to manage the whole process from triage, admission, emergency patient management, surgeries, physiotherapy, discharge and rehabilitation. Since, the symptom may vary from mild to severe one so patient can be triaged according to Manchester Triage System with appropriate modifications according to COVID-19 infection.

Key Words: COVID-19; Manchester Triage System; Trauma

INTRODUCTION

COVID-19 is a disease caused by SARS-COV2. SARS-COV2 is one of 7 types of coronavirus including those that cause MERS and SARS. There are 2 strains of COVID L and S type coronaviruses are RNA viruses. Coronavirus has shown angiotensin converting enzyme foe ACE2 receptor for cell entry. Indian taxonomy of viruses has given the name SARS while WHO has given the name COVID. WHO has declared this as public health concern on 30th June, 2020 and COVID-19 pandemic on 11th March, 2020. Main symptoms are fever, cough and shortness of breath, anosmia and ageusia. Symptoms can vary from mild fever to severe pneumonia, respiratory failure, septic shock and death. Spread of disease is mainly by aerosol and droplet method.

ATriage at emergency department aims to prioritize the patients where clinical demands exceed capacity. Triage is a process that is critical to effective management of modern emergency department [1]. Triage systems aim, not only to ensure clinical justice for the patients, but also to provide an effective tool for departmental organization, monitoring and evaluation and as burden in emergency department worldwide is steadily increasing triage remains a fundamental intervention to manage patients flow safely and to ensure the patients who need immediate medical intervention are timely treated, particularly in case of overcrowding [2-5].

Triage is clinical management tool used by emergency services providers to guide patients flow when the need for medical attention exceeds the available resources [6-8].

Since the symptom may vary from mild to severe one so patient can be triaged according to Manchester triage system, which is a tool used world-wide to manage patients safely when clinical demands need exceeds capacity. This system contains the patients who need immediate intervention are given color code-red, who need very urgent intervention within 10 minutes are given color code-orange, who need urgent intervention within 60 minutes are given color code-yellow, who need standard intervention given color code green and who need no urgent intervention within 240 minutes given color code-blue. Since COVID patients also need triaging so we can also use Manchester triaging system for COVID-19 patients[9].

AIMS AND OBJECTIVES

Modified Triage System of COVID patients using Manchester triaging system

Inclusion criteria:

1. All patients age between 15 years to 60 years.
2. Patients having already COVID positive report.
3. All symptomatic patients.

Exclusion criteria:

1. Patients below age 15 year and greater 60 years.
2. Non-surgical patients including gynecological.

MATERIALS AND METHODS

In this study all patients who attended emergency and trauma center were screened at level 1. At level 1 patients were categorized into three category

Level 1 patients having already report of COVID.

Level 2 patients with O.P.D. slip marked with red (with history of fever, breathlessness, international travel within 28 days, contact with COVID positive person, contact within a month, healthcare worker).

Level 3 with O.P.D. slip with green (no history of fever, breathlessness, international travel and contact with COVID patients.

They were screened at three levels-level 1 to 3.

At Level 1 type 1 patient are directly sent to COVID hospital.

Type 2 patients and type 3 patients were further screened at Level 2 done by medical officer. He further evaluate the patients according to their symptom and if he suspects patients to be positive and patients with O.P.D. slip with red mark (type 2) then patients are sent to holding area of COVID hospital and if patients does not look like having COVID infection and O.P.D. with green mark (type 3) patients is admitted in emergency and sample of throat and nasal swab is taken by using all aseptic precaution sample of COVID hospital and emergency is taken by expert technician of microbiology department and sent to pathology department where two method were applied for testing. Previously RT-PCR was used to give result but this was taking too much times so when truant machine was available in hospital mostly samples were processed by this as its result are very fast and can give

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result within 30 min while RT-PCR took a day to give result. If report comes positive patients were shifted to isolation ward. Patients with negative report were treated in emergency patients in isolation ward were monitored for SpO₂, pulse rate, blood pressure. If any parameter is abnormal specially SpO₂ if less than 94% then patients is shifted to ICU and if they need ventilator then put on ventilator or oxygen according to their need. Thus using this method all COVID patients who need emergency services are properly triaged and benefitted accordingly. Non COVID patients can be benefitted with telemedicine O.P.D. but we cannot endanger the life of COVID patients because mental trauma is another issue for patients as well as for treating doctors. Since the infectivity of COVID is very high and disease is very contagious so special FLU O.P.D. is necessary for patients with minor symptom and proper separation of COVID patients with non COVID patients is necessary during emergency admission. so utilizing Manchester triaging system, a modified Manchester system can be made for COVID patients so that there will be no mixing of COVID patients with non COVID patients.

Our study has triaged the COVID patients in type 1, 2 and 3. Type 2 and 3 are further triaged into Level 2 and level 3. this shows the effectiveness of triaging system of COVID patients. This triaging of COVID patients can be a useful tool for proper treatment and management of COVID patients in this pandemic era (Table 1).

TABLE 1
Manchester triage system

Manchester Triage System	
1. It categorize the patients in 5 group	In this we categorize the patients in 3 group and all 3 group are screened up at 3 levels from level 1 to level 3
2. Five Color coding is used -red, orange, yellow, green and blue	Color coding of OPD slip red and green depending on some questionnaire
3. Use of PPE kit N95 mask face shield is not necessary	Use of PPE kit N95 mask face shield is mandatory
4. In view of outbreak as disease is very contagious in nature if we use MTS disease can be transmitted from COVID patients to non-COVID patients.	In this study we screen patients at 3 levels so mixing of covid patients to non COVID patients is avoided.

RESULTS

Triage remains a fundamental intervention to manage the patients safety and as burden in emergency department worldwide is steadily increasing triage remains a fundamental intervention to manage patients flow safely and ensure the patients who need immediate medical intervention are timely treated, particularly in case of overcrowding [2-5]. Manchester triage system is one of the most important triage system when overloading in emergency department occur and it categorize the patients in one of the five category. Since in this pandemic era where overcrowding of patients is high and disease is very contagious In nature so we have to triage the patient and we don't we give risk to the COVID patients by endangering their life and to the non COVID population by giving the disease. In our study we broadly categorize the patients into 3rd category in type 1, 2 and 3 and thus preventing mixing of asymptomatic patients or patients having mild symptom of COVID patients with non- COVID patients. Further in emergency department patients are screened at 3 level from level 1 to level 3 so that no patients can be neglected and those who need isolation ward were admitted to isolation ward and those who need ICU cases were immediately shifted to ICU and those who needed immediate intervention in that case intervention was done so that patients were segregated without compromising their treatment with undue delay.

Thus it seems triaging is a useful tool in COVID patients. As disease is very new to everyone and there is only limited knowledge about this disease so this idea is based on very short experience and if there is further knowledge about this disease further improvement can be done with time.

Modified Manchester System

Level 1:

1. Type 1 patient with already having COVID positive report
2. Type 2 patients with O.P.D slip with red mark

3. Type 3 patients with O.P.D slip with green mark

Type 1 is directly sent to isolation ward

Level 2:

1. Type 2 with strong suspicion of COVID infection
2. Type 3 considering as non COVID

Level 3:

Type 3 patients are further screened by COVID test in emergency

DISCUSSION

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CONCLUSION

Manchester triage system is one of the most important triage systems when overloading in emergency department occur and it categorizes the patients in one of the five categories. This system contains the patients who need immediate intervention are given color code red, who need very urgent intervention within 10 min are given color code-orange, who need urgent intervention within 60 min are given color code-yellow, who need standard intervention given color code green and who need no urgent intervention within 240 min given color code-blue. Similarly in our study a modified Manchester system is used in which we are having 3 categories of patients 1st with positive report at Level 1 and sent to isolation ward from level 1 directly. category 2nd and 3rd are screened at Level 2 by emergency medical officer and category 2nd cases are cases which at level 2 medical officer strongly suspect the cases to be positive case is sent to holding area where sampling is done for COVID and if the result is positive case is sent to isolation ward and if the result is negative case is shifted to trauma center And category 3rd are those category which medical officer at level 2 screens as negative patients and they are admitted in trauma center. Then trauma center acts as a Level 3 where patients are further screened up by test for COVID antibody and if result is positive then again patients are shifted to isolation ward and if result is negative further intervention are done at trauma center. Since in this pandemic era where overcrowding of patients is high and disease is very contagious in nature so we have to triage the patient and if we don't we give risk to the COVID patients by endangering their life and to the non COVID population by giving the disease. In our study we broadly categorize the patients into 3rd category in type 1, 2 and 3 and 3 levels or station and thus preventing mixing of asymptomatic patients or patients having mild symptom of COVID patients with non- COVID patients. Since the patients are screened at 3 levels from L1 to L3 level this prevents undue mixing of patients and segregate the patients safely. This also gives a satisfaction to treating doctors in trauma center as they don't need any specific precaution as donning of PPE kit in every case face shield in emergency. Only N95 mask and gloved is sufficient for attending the patients and in isolation

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ward doctors are ready with full precaution as they know they are dealing with COVID patients, thus modification of Manchester system seems to be a very useful tool in this pandemic era for COVID patients and it gives full safety to non-COVID patients. This study shows that there are many factors which warrant changes in the existing Manchester Triage System, especially during COVID pandemic. It will also be helpful in triaging other such type of pandemic.

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mask and gloved is sufficient for attending the patients and in isolation ward doctors are ready with full precaution as they know they are dealing with COVID patients, thus modification of Manchester system seems to be a very useful tool in this pandemic era for COVID patients and it gives full safety to non-COVID patients. This study shows that there are many factors which warrant changes in the existing Manchester Triage System, especially during COVID pandemic. It will also be helpful in triaging other such type of pandemic.

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

Approved by Institutional Ethics Committee

REFERENCES

1. EFitzGerald G, Jelinek GA, Scott D, et al. Emergency department triage revisited. *Emerg Med J.* 2010;27(2):86-92.
2. American Academy of Pediatrics Committee on Pediatric Emergency Medicine. Overcrowding crisis in our nation's emergency departments: is our safety net unraveling? *Pediatrics.* 2004;114(3):878-888.
3. Institute of Medicine. IOM report: The future of emergency care in the United States health system. *Acad Emerg Med.* 2006;13(10):1081-1085.
4. A. Harris, A. Sharma. Australasian College for Emergency Medicine. Access block and overcrowding in emergency departments. *Emerg Med J.* 2010;27(7):508-511.
5. England NH. Transforming urgent and emergency care services in England. Urgent and emergency care review end of phase I report. 2013.
6. Jones K, Marsden J, Windle J. Manchester risk rating system-risk rating emergency and emergency. Minas gerais: Brazilian rasco classification group. 2010.
7. Emergency nurse: The journal of RCN accident and emergency nursing association. 2009; 17(4):16-9.
8. Santos AP, Freitas P, Martins HM. Manchester Triage System version II and resource utilization in the emergency department. *Emerg Med J.* 2014;31(2):148-152.
9. Oredsson S, Jonsson H, Rognes J, et al. A systematic review of triage-related interventions to improve patient flow in emergency departments. *Scand J Trauma Resusc Emerg Med.* 2011;19(1):43.