Research Article

Covid Screening Analysis - A Report of First Wave in Himachal Pradesh Medical College

Harjitpal Singh*, Ravinder Kaur, Sanjay Kumar, Anil Kumar Verma and Suman Yadav

Department of ENT, Dr Radhakrishnan Govt Medical College, Hamirpur, India

*Corresponding Author: Harjitpal Singh, Department of ENT, Dr Radhakrishnan Govt Medical College, Hamirpur, India.

Abstract

Background: Covid-19 when started in India in early 2020, the medical fraternity in our country was not well versed with the new disease and its management. Study was done to ascertain importance of various measures for diagnosis of this new disease.

Methods: A cross sectional study was conducted using thermal screening for body temperature, influenza like symptoms and history of travel and contact with covid-19 patient and RT-PCR of patients with positive symptoms in patients attending OPD services.

Conclusion: Use of thermal screening alone may not be effective in detecting Covid-19 but if it combined with symptomatic screening the sensitivity can be increased and it can be used as a tool to decrease transmission in low recourse settings.

Keywords: Covid-19; Thermal Screening; RT-PCR

Introduction

Covid-19 when started in India in early 2020, the medical fraternity in our country was not well versed with the new disease and its management. Every measure was applied to check the disease and its spread in the community. Screening and thermal checking of every one visiting hospitals and other public places was widely applied in our country like everywhere in the world. We are presenting a study which was conducted to know efficacy of such measures.

Materials and Methods

Aim of the Study: To know/establish relation of thermal screening for body temperature, influenza like symptoms and history of travel and contact with covid-19 patient, and RT-PCR report of patients.

Study design and setting

A cross sectional study was conducted at Dr Radhakrishnan Government Medical College, Hamirpur using thermal screening for body temperature, influenza like symptoms and history of travel and contact with covid-19 patient and RT-PCR of patients with positive symptoms in patients attending OPD services.The study was conducted from 27th March 2020 to 31stDec., 2020 and was approved by the Institutional Ethics Committee, Dr RKGMC, Hamirpur.

Thermal and symptomatic screening

Information including age, gender, contact with Covid-19 patient, travel to Covid-19 high load area within (at that time this was taken as incubation period, so symptoms within this time suggested the probable source of infection) 14 days and symptoms suggestive of influenza like illness. All persons were also screened using calibrated forehead non-contact thermometers (Non-contact

Thermometer; IT-122; Accuracy ±0.2°C and a single body temperature was taken and recorded. All the patients with either fever i.e. temperature >37.5°C or symptomatic were then (to confirm the virus infection) subjected to RT-PCR test.

Sample collection and point of care RT-PCR SARS CoV-2 testing

The sample collection was routinely done in isolation ward of the hospital after the thermal and symptomatic screening. Nasopharyngeal swabs were collected using flocked swabs and were immersed in 2 mL of viral transport medium. The specimens were then tested using the RT-PCR in VDRL, Dr RKGMC, Hamirpur. Patients who tested positive were admitted to DCHC, Bhaota , Hamirpur and others were asked to self monitor the symptoms and follow quarantine guidelines.

Eligibility criteria

All patients attending OPD services except (as for sick persons, priority was to save their life while taking all the precautions while managing them) for very sick patients requiring urgent interventions were included in the study.

Ethical considerations

The data used in the study was originally collected as one of the efforts to prevent and control COVID-19 transmission and therefore, the researchers had no direct patient interaction. Permission to conduct the study was sought from the head of the institution and institutional ethics committee.

Laboratory confirmation

A real-time RT-PCR (standard test for confirmation and then the only test for this purpose) was used for the quantitative detection of ribonucleic acid from SARS-CoV-2 which was in nasal and oropharyngeal swab specimens from patients suspected of COVID-19. Patient was confirmed as positive or negative by a microbiologist at VDRL.

Statistical analysis

The data received was organized and checked for completeness in Microsoft Excel and then analysed using IBM SPSS_ V 22.O. The sensitivity, specificity, positive predictive values, negative predictive values, positive and negative Likelihood ratios were obtained using the diagnostic statistical test.

Results

A total 151640 patients were screened during the study period during the first COVID-19 wave. Out of which 1480 patients had either body temperature >37.5 °C or symptoms of influenza like illness. Some had history of travel or contact with confirmed Covid-19 case but were asymptomatic. All 1480 were subjected to RT-PCR.

Age and gender wise distribution of screened patients

Most of the screened patients belonged to 40 to 60 year age group and no gender wise statistically significant difference (p value > 0.05) Median age was 42 years (IQR: 32-51years).

Age group (years)	Male N (%)	Female N (%)	Total N (%)
0 -9	15(47.0%)	16(53.0%)	31(2.1%)
10 -19	48(55.4%)	38(44.6%)	86(5.8%)
20 -29	115(55.6%)	92(44.4%)	207(14.0%)
30 -39	162(54.0%)	138(46.0%)	300(20.3%)
40 -49	214(58.0%)	155(42.0%)	369(24.9%)
50 -59	170(47.0%)	192(53.0%)	362(24.5%)
60 -69	39(39.8%)	59(60.2%)	98(6.6%)
70 - 79	06(37.5%)	09(62.5%)	15(1.0%)
80 -89	06(66.7%)	3(33.3%)	9(0.6%)
90 and above	01(33.3%)	02(66.7%)	3(0.2%)
Total	776(52.4%)	704(47.6%)	1480

Table 1: Age and gender wise distribution.

History and signs and symptoms wise distribution

Out of 1480 patients who were subjected to RT-PCR, 350(23.6%) patients had either fever on thermal screening or symptoms of ILI. Most common symptoms were headache, body aches, cough and sore throat. Around 30% had fever at the time of screening. The median body temperature as measured by the non-contact thermometers was 36.5 (IQR: 36.3-36.7). 53% had recent travel history to high load districts as notified by government of India from time to time and 44% had contact history with covid- 19 positive cases (Figure 1).

Figure 1: History and Signs and Symptoms wise distribution.

Comparison of Flu clinic screening with RT-PCR

76.3% had contact history or travel history but they were asymptomatic. The positivity rate on RT - PCR of screened patients was 65.9%. Around 34% of patients who were positive on RT- PCR were asymptomatic (Table 2).

Screening at flu clinic	RT-PCR Test		Total
	Positive	**Negative**	
Positive (fever or symptomatic)	145	205	350
Negative	75	1055	1130
Total	220	1260	1480

Table 2: Flu clinic screening Vs RT-PCR.

Validity of flu clinic screening as compared to RT-PCR

Sensitivity and positive predictive value of screening at flu clinic when compared with RT -PCR were 65.9% and 31.0% respectively. Specificity and negative predictive value were 83.7% and 95.6% respectively (Table 3).

Statistic	Value (%)	95% CI
Sensitivity	65.9	59.2 - 72.1
Specificity	83.7	81.5 - 85.7
Positive Predictive Value	31.0	27.7 - 34.5
Negative Predictive Value	95.6	94.8 - 96.3
Accuracy	81.9	79.8 - 83.8

Table 3: Validity of flu clinic screening.

The likelihood ratios (LRs) of screening as a diagnostic test

The positive likelihood ratio (LR) was found to be 4.05 (95% CI: 3.46 - 4.74) and the negative LR was 0.41 (95% CI: 0.34 - 0.49) (Table 4).

Test Result	Likelihood Ratio	95% Confidence Interval
Positive	4.05	3.46 - 4.74
Negative	0.41	0.34 - 0.49

Table 4: The likelihood ratios (LRs) of screening.

Discussion

Sensitivity of flu clinic screening in our study was 65.9% (95% CI:59.2 - 72.1) which was moderate as compared to RT -PCR. Thermal screening is not very sensitive tool in covid-19 screening as fever is not always present in patients. Presentation of Covid-19 also changed from time to time. It is now well established that majority of covid-19 infected patients remain asymptomatic [1-3]. Specificity of screening in our study was 83.7% (95% CI: 81.5 - 85.7) means only around 84% of the patients actually (as they were afebrile and without any other symptom) not having Covid -19 were correctly identified by screening.

Positive predictive value was 31.0% (95% CI: 27.7 - 34.5) is low means screening will detect a high number of (fever or other symptoms may not be due to covid) false positive results. It also signifies the inaccuracy of flu clinic screening in detecting covid-19 patients [1].

Negative predictive value of screening was 95.6% (95% CI: 94.8 - 96.3). Around 96% of patients who were declared negative on screening means there were no symptoms or fever were negative on RT -PCR also. If flu clinic screening declares a person negative then high probability of getting a negative RT- PCR will be there.

Positive likelihood ratio is 4.05 means that probability of positive screening test i.e. (symptomatic still have more chances of contacting covid than non symptomatic) either fever or symptoms of ILI in people with covid -19 will be 4 times higher than asymptomatic and afebrile. It shows that a positive thermal screen test and symptomatic screening is a significant indicator of a positive RT-PCR test [1].

Negative likelihood ratio of 0.41 implies that there is low probability of having flu clinic screening test negative in patient no having the disease i.e. covid-19.

Our study gives a good description of the effectiveness of thermal screening and symptomatic screening at flu clinic in the detection of COVID-19. Findings are consistent with Nsawotebba, Andrew., *et al*. and Quilty., *et al*. who commented on thermal screening only which showed that temperature screening alone, at exit or entry, is not an effective way to stop the spread. But if it is combined with symptomatic screening the usefulness can be increased during peak of epidemic though infected individuals may be in the incubation period, may not express apparent symptoms early on in the course of the disease, or may dissimulate fever through the use of antipyretics. Sensitivity can be further increased if people are educated and they don't hide their symptoms [4].

Conclusion and Recommendation

Use of thermal screening alone may not be effective in detecting Covid-19 but if it is combined (thermal screening plus other history of travel to suspect area and with flu like symptoms) with symptomatic screening the sensitivity can be increased and it can be used as a tool to decrease transmission in low recourse settings. Sensitivity may be low due to people hiding their symptoms due to fear and stigma so, people should be educated to start early treatment and to prevent transmission. Health workers should (screening persons must be expert in taking temperature right taking in consideration the distance and duration while measuring it) be trained in use of (must know even handling of such equipment) thermal scanner.

Acknowledgments

Funding

Conflict of Interest

Nil.

Bibliography

1. Nsawotebba Andrew., *et al*. "Effectiveness of thermal screening in detection of COVID-19 among truck drivers at Mutukula Land Point of Entry, Uganda". *PloS one* 16.5 (2021): e0251150.

2. Hassan S., *et al*. "Coronavirus (COVID-19): A Review of Clinical Features, Diagnosis, and Treatment". *Cureus* 12.3 (2020): e7355.

3. Khan M., *et al*. "Epidemiological and clinical characteristics of coronavirus disease (COVID-19) cases at a screening clinic during the early outbreak period: a single-centre study". *Journal of Medical Microbiology* 69.8 (2020): 1114-1123.

4. Quilty Billy J., *et al*. "Effectiveness of airport screening at detecting travellers infected with novel coronavirus (2019-nCoV)". *Euro Surveillance* 25.5 (2020): pii = 2000080.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/
Submit Article: www.actascientific.com/submission.php
Email us: editor@actascientific.com
Contact us: +91 9182824667