

RADIOLOGY DEPARTMENT PREPAREDNESS FOR COVID-19 PANDEMIC IN HEALTH CARE INSTITUTES OF INTERIOR SINDH, PAKISTAN

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ABSTRACT

OBJECTIVE: Considering the important role of diagnostic imaging in disease management this audit was done to assess the radiology department preparedness of health institutes of interior Sindh regarding COVID-19.

METHODS: This interview based clinical audit of health institutes of interior Sindh was undertaken via telephone from March 19, 2020 till March 25, 2020. Total of 12 Cities/Districts of Interior Sindh were covered. Total of 19 imaging departments were surveyed. Twenty-one (21) radiologists working at these institutes were called and interviewed. Their response was noted regarding all the study items. **RESULTS:** Only 36 % of the centers had screening practices for SARS-CoV-2 infection. None of the imaging department had enough supply of personal protective equipment (PPEs). None of the imaging department had imparted training to its staff on the safe practices regarding covid-19 and PPE use. None of the imaging department had standard decontamination protocols in place. While only fifty percent of the imaging departments had portable equipment (X-ray, ultrasound). Not a single department had the facility of remote reporting. **CONCLUSION:** None of the department was found fully prepared for COVID-19 pandemic. The results depicted poor attentiveness of the radiology departments of interior Sindh regarding the COVID-19 pandemic. The results warrant early educational and administrative intervention to introduce positive and productive preparedness activities.

Keywords: Radiology, Department, Preparedness, Sindh.

Introduction

The world is currently dealing with the Coronavirus Disease 2019 (COVID-19) pandemic. The virus responsible for the pandemic is called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ The COVID-19 which was initially reported from China has currently affected more than 170 countries. It has affected approximately 684,652 people throughout the world, being at the same time responsible for approximately 32,113 deaths. Pakistan has also been

a victim of the pandemic, reporting 1,526 cases and 14 deaths.²

Realizing the burden of disease, the Radiology Editorial Board recently published policy guidelines prepared by a team of radiologists and infection control experts working at world-class healthcare systems. The main aim of these preparedness policy guidelines, regarding COVID-19, is that the rest of the healthcare centers compare their current pre-

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paredness activities with the provided guidelines and devise a well thought out plan to treat patients with COVID-19.³ The Radiological Society of Pakistan recently also published its policy guidelines regarding radiology preparedness for COVID-19.

There is an increasing attention towards the role and appropriateness of Chest Radiographs (CXR) and Computed Tomography (CT) for the screening, diagnosis and management of patients with any association to the COVID-19 infection. In China, the epicenter of the pandemic, imaging has been at the forefront of investigation for patients with suspected or confirmed COVID-19 infection. As a result, computed tomography (CT) of the chest has been utilized on an unprecedented scale.⁴ However, provision of diagnostic imaging services to large numbers of patients suspected of having COVID-19 during pandemic can be challenging.^{5,6} Contributing to this, is the limited availability of viral testing kits to date.^{1,7} In resource poor settings, imaging can be used to triage patients presenting in the moderate to severe form with respect to clinical signs and symptoms.^{5,8} In addition, another challenging task is that how radiology services can be provided to those patient who are not suspected of Covid-19 and need imaging services on urgent basis like patient with acute abdominal emergencies and patients with cancers whose treatment decision is solely based on imaging and image guided biopsies.

Considering current situation, health centers are at the risk of contamination and may prove to be potential sources for infection spread in the local population. This would not only result in an outbreak but also the closure of these health facilities, vital to the well-being of the local population. Although personal protection equipment (PPE) guidelines vary between countries, the consensus is that radiology staff wear a mask, goggles/face shield, gloves, and an isolation gown.^{5,6}

Thus, RSP (Radiological Society of Pakistan) has strongly emphasized its role in inspecting the preparedness of imaging preparedness in response to the COVID-19 outbreak. All RSP members are enthusiastically working on a daily basis to discover safe imaging guidelines that can be uniformly implemented at national level to reduce morbidity, mortality and minimize disease transmission. Before promoting these national guidelines and policies, RSP conducted

a survey to assess the preparedness of imaging departments of different hospitals in interior Sindh regarding COVID-19, in comparison with standard health care guidelines being practiced by the rest of the world.³

Material and Methods

This interview based clinical audit of health institutes of interior Sindh was undertaken via telephone from March 19, 2020 till March 25, 2020. A standard questionnaire consisting of fourteen items was prepared from the policy guidelines of Radiological Society of North America (RSNA) and Radiological Society of Pakistan (RSP). The questionnaire was used only in one language i.e English. All of the participants were comfortable with that. Initially the questionnaire was pretested among radiologists of Aga Khan University Hospital and members of executive council of radiological society of Pakistan for language and content validity. Total of 12 Cities/Districts of Interior Sindh were covered. Districts covered were Hyderabad, Larkana, Sukkur, Nawabshah, Thatta, Khairpur, Mirpur Khas, Jamshoro, Badin, Jacobabad, Mithi and Tando Muhammad Khan. Total of 19 imaging departments were surveyed. Twenty-one (21) radiologists were called on mobile/ telephone and interviewed by principal investigator. Starting with formal introduction, purpose and verbal consent, each participant was asked of the same questions regarding their department preparedness for the Covid-19 pandemic. Their response was noted. The average time spent with each participant was about 15-20 minutes.

Results

Out of the 19 imaging departments 12 belonged to public sector and 7 were from the private sector. Twenty-one radiologists working at these departments were contacted and interviewed. Their (Yes/No) response was taken regarding the questionnaire and represented their department's preparedness for COVID-19. Only seven (36.8 %) hospitals were found to have following the screening practices and none of the radiology department had front desk screening. Not a single radiology department was exercising the decontamination practices. None of the radiology

Question	Response	
	Yes	No
<i>Does your hospital have screening in place for SARS-CoV-2 infection?</i>	7(36.8%)	12(63.2%)
Does your department have front desk screening in place for SARS-CoV-2 infection for outpatients?	0(0%)	19(100%)
Does your department have put in place checks to limit visitors?	4(21%)	15(79%)
Coordination/communication within the facility and plan for external communication related to COVID-19?	2(10.5%)	17(89.5%)
<i>Does your department have the standardized decontamination procedures/protocol in place?</i>	0(0%)	19(100%)
Does your department have portable imaging equipment (x-ray machine, ultrasound)?	10(52.6%)	9(47.4%)
Does your department have dedicated imaging suits (Radiography, Ultrasound, CT)?	0(0%)	19(100%)
<i>Do the radiology staff have got any training on infection control protocols and how to use Personal Protective Equipment (PPE)?</i>	0(0%)	19(100%)
<i>Does your department have enough supply of Personal Protective Equipment (Face masks, Goggles, Disposable fluid resistant gowns, Disposable gloves)?</i>	0(0%)	19(100%)
Does your department have the capacity of remote reporting in case of isolation of faculty or patient surge?	0(0%)	19(100%)
Do your Staff and Radiologist work in divided groups to avoid contact with Covid-19 Patients?	6(31.6%)	13(68.4%)
Do you have any pregnant staff, if yes is she assigned to work?	0(0%)	19(100%)
Is your department using any dedicated transportation pathway for Covid-19 patients?	0(0%)	19(100%)
Are you/will you be pre-informed about Covid-19 patients sent to your department for any kind of imaging?	2(10.5%)	17(89.5%)

The questions in italics are the priority areas regarding the preparedness for Covid-19.

Table 1: Radiology department preparedness survey form and results

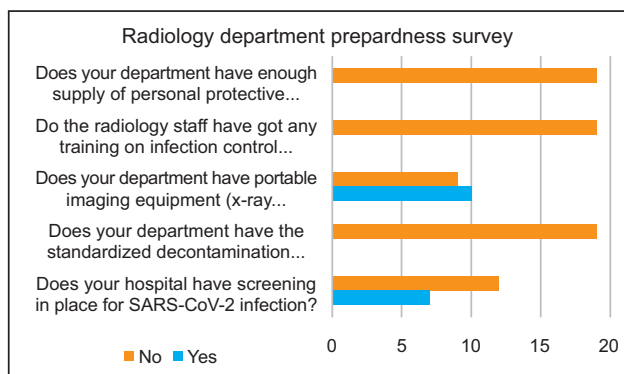


Figure 1: Chart shows status of the radiology department preparedness in the priority areas.

departments had dedicated imaging suits for Covid-19 patients. Regarding PPE supply and infection control training of staff, none of the department had got enough supply of PPEs and neither the staff had received any training regarding PPEs. Only two

(10.5%) departments were having the proper communication pathways where they would be informed of any Covid-19 positive patient being referred for imaging. The detailed results are presented in (Tab.1) and (Fig.1).

Discussion

Since imaging has an important role in the screening or diagnosis of COVID-19, that puts the radiology department and its personnel at risk of contracting and disseminating this highly contagious disease. Guidelines have been developed worldwide regarding the radiology department preparedness for the COVID-19 pandemic.^{3,9,10} Radiology preparedness is a set of policies and procedures directly applicable to imaging departments designed to (a) achieve sufficient capacity for continued operation during a health care emergency of unprecedented proportions, (b) support the care of patients with COVID-19, and (c) maintain radiologic diagnostic and interventional support for the entirety of the hospital and health system.^{3,9}

Comparing our results with the standard preparedness and practices, the findings are really disturbing. Only 36 % of the centers had screening practices for SARS-CoV-2 infection, clearly putting patients and staff equally at risk. The limited availability of personal protective equipment (PPEs), lack of standard decontamination protocols/procedures, lack of proper communication between the department and the rest of the hospital and no training or education for the staff on the proper use of PPEs and standard preventive practices are signs of alarm. The guidelines and standard practices call for sufficient availability of PPEs and its efficient use, effective coordination between the radiology department and rest of the hospital for COVID-19 preparedness and standard infection control measures.^{3,9,11} None of the department had dedicated imaging suits for suspected or confirmed COVID-19 cases, thereby risking all other patients of contracting the viral illness. Only fifty percent of the imaging departments had portable imaging equipment (x-ray machine, ultrasound) which is in violation of the standard practices advising portable radiographic equipment be used whenever possible to limit transportation of patients.^{3,9,10,11} None

of the imaging departments had the service of remote reporting which, of course, would be beneficial in case the situation gets worse. While the standard practices advocate that radiology department should work in teams on a daily/weekly basis, to minimize the exposure and better utilize the human resource.^{3,9,10,11}

Based on above observation following immediate guidance was provided:

- Development of triage pathway in front desk radiology departments through questionnaire for all patients to exclude the patient with high pretest probability of COVID-19.
- Immediately make standard operating procedures for safe imaging of patients with suspected or known COVID-19 separate for in and out patients.
- Special sessions for staff education regarding COVID-19 prevention especially regarding correct use of PPE and standardized protocols for decontaminating imaging rooms after caring for a COVID-19 patient.
- Application of “social distancing” policies for staff, trainees, and faculty.
- Improving capability for remote interpretations (home, other sites) in the case of exposure.

Recommendations/Immediate/future action plans on the behalf of RSP:

- Immediate guidelines about preparedness of imaging department were made with reference to Current guidelines of American College of Radiology (ACR), Royal College of Radiologists (RCR) and Radiological Society of North America (RSNA) regarding COVID-19 and released on RSP official website and were shared with the radiologists who were contacted.
- WhatsApp Group (social networking group) was made specifically for interior Sindh radiologists to disseminate updated guidelines and information immediately.
- Immediate supply of PPE was released to imaging department with significant resource constrain environment.
- Further information was provided about RSP hotline numbers in case of immediate assistance on kind inquiry. Contact details of current RSP Sindh representatives were also shared with them.

- Re audit in coming weeks to reassure preparedness of imaging departments according to standard national and international guidelines.

Conclusion

None of the department was found fully prepared for COVID-19 pandemic. The results depicted poor attentiveness of the radiology departments of interior Sindh regarding the COVID-19 pandemic. The results warrant early educational and administrative intervention to introduce positive and productive preparedness activities.


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