AWARENESS AND IMPACT OF CORONA VIRUS DISEASE 2019 (COVID-19) ON NEUROSURGEONS

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ABSTRACT

Objective: To assess the knowledge of neurosurgeons about COVID-19, its effects on them and effectiveness of tele medicine in triaging patients during this pandemic.
Study Design: Cross sectional survey.
Place and Duration of Study: Department of Neurosurgery, CMH Rawalpindi from May 2020 to May 2020.
Methodology: After taking approval from ethical committee a questionnaire was spread through social media in 120 Neurosurgeons including consultants and post graduate Residents out of which 111 responded. The questionnaire included socio-demographic details, questions pertaining to the overall knowledge about COVID-19, tele medicine and its use for triaging patients and impact of COVID-19 on various aspects of neurosurgeons.
Results: On the basis of gender, females were 10 (9%) and majority study population being PG residents 69 (76.66%) with the mean age of 33.43 ± 5.6 years. 76 (68.46%) neurosurgeons reported that they were familiar with the protocols of treating patients during COVID-19 outbreak and 86 (77.47%) opted for treating only emergency cases and deferring elective procedures.
Conclusion: COVID-19 has affected personal, social and educational activities of neurosurgeons; however, majority of neurosurgeons are familiar with the protocols of treating patients during this pandemic and are using telemedicine for triaging patients.

Keywords: Covid-19 Virus Disease, Telemedicine, Triage.

INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) also known as corona virus disease 2019 (COVID-19) pandemic that started in China, reached Pakistan on 26th February 2020 when Pakistan reported first its 2 cases of corona virus who had travelled from Iran. And on 13th march, 2020 first locally transmitted case was reported. Ever since the outbreak, it is becoming increasingly challenging for the health care system. There is an onerous task of maintaining a balance between the risk of spread of this potentially lethal infectious disease among patients as well as health care professionals and the need of evaluation and management of routine elective and urgent medical issues[1].

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Received: 00 Jan 2000; revised received: 00 Jan 2000; accepted: 27 Jul 2020

Corona virus affects the respiratory system and the symptoms vary from mild symptoms such as dry cough, dyspnea, pharyngitis, and fever to the other end of spectrum being fatal complications such as severe bilateral pneumonia, Acute Respiratory Distress Syndrome, septic shock leading to multi-organ failure[2,3]. In COVID-19 positive / suspected patients, Level 3 PPE is recommended for aerosol generating procedures and in almost all neurosurgical procedures a moderate to higher amount of aerosol can be generated by craniotome cutters, drills, bipolar /monopolar diathermy. And Level 1 PPE is recommended for clinical activities[4].

Resource allocation for emergency and critical care of corona patients has affected the surgical practice in all specialties[5] including neurosurgery[6]. Although elective cases have been postponed for indefinite period of time as still there is no knowledge of natural history of this

novel viral infection, still most of neurosurgical cases fall into urgent or emergent category given the time sensitive nature of neuropathology. As our hospitals have become overwhelmed for patients requiring emergency surgery such as those with extradural, subdural hematomas and some intracerebral hematomas or caudal equina syndrome cases proceed as usual. But there are nonemergency but urgent cases like patient with progressive neurological deficit from a space occupying lesion or cervical spondylotic myelopathy[1]. In these controversial scenarios having to choose one patient over another and to minimise exposure risk for staff as well as other patients is not only morally formidable but it is every surgeon's worst nightmare. It puts neurosurgeon in a psychologically distressing situation in addition to antecedent concerns of being at risk of contracting the virus themselves and being a continuous potential threat for their families thus affecting the mental health of caregivers. Little local literature is available showing the effect of COVID-19 on working of neurosurgery and neurosurgeons. So this survey was carried out to assess neurosurgeon's knowledge, their awareness of COVID-19, its impact on their life and to use of tele-medicine for triaging patients.

METHODOLOGY

After taking approval from ethical committee (no. 84/06/20-25), this survey was carried by Neurosurgery Deptt CMH Rawalpindi from 15th May 2020 to 30th May 2020. 120 Neurosurgery consultants and Post graduate (PG) residents were included in the study using the convenient sampling technique a questionnaire on Google Forms was sent through social media to all of them out of which 111 filled the survey with a response rate of 92.5%. Incomplete forms were excluded and rest of all the responses were included in the study. The sample size was calculated by using the Clinc Calc calculator with a level of significance 5%, power of test kept at 85% to reduce the sample size, Population proportions 38 & 14, total sample size of 116 was calculated which was increase to 120 neurosurgeons[7].

The questionnaire included socio-demographic details, questions pertaining to the overall knowledge about COVID-19, telemedicine and its use for triaging patients and impact of COVID-19 on various aspects of neurosurgeons. The data was collected, compiled, arranged in a systematic manner, and analysed in terms of frequencies using SPSS Version 22. Frequencies, percentages, mean and standard deviation were calculated for qualitative and quantitative variables like age and gender. The test of significance to evaluate the qualitative variables was Chi-Square Test along with *p*-values.

RESULTS

Descriptive statistics of demographic details of the total of 111 respondents are displayed in table-I. On the basis of gender, females were 10 (9%) and majority study population being PG residents 69 (76.66%) with the mean age of 33.43 ± 5.6 years. A *p*-values were calculated of variables with correlations to gender and qualification. Gender had no significant impact on the knowledge and attitude ($p>0.05$) while the *p*-values for qualification are given in tables-II, III & IV. According to the results, 76 (68.46%) neurosurgeons reported that they were familiar with the protocols of treating patients during COVID-19 outbreak as mentioned in table-III. Majority of the respondents 86 (77.47%) opted for treating only emergency cases and deferring elective procedures as mentioned in table-III.

Table-I: Demographic details of the study population.

Variable	Study Population (n) %
Gender	
Female	10 (9.00%)
Male	101 (90.99%)
Qualification	
Post Graduation Residents	82 (73.87%)
Consultants	29 (26.12%)

DISCUSSION

As the incidence of COVID-19 continues to rise exponentially in Pakistan it is having

profound effect on neurosurgical community both in terms of their clinical practice and training as well as on their own psychosocial and physical health. So this study aimed to assess the awareness and impact of SARS-CoV-2 pandemic in neurosurgical community.

Almost 90% of our respondent were male surgical residents. In contrast to a study conducted by Alhaj *et al* based on international data in which 26.9% of residents were female. 48.1% of their respondents were directly dealing with COVID-19 patients[7].

More than two thirds of our study population responded positively to the negative influence of pandemic on their personal and social life ultimately affecting their mental health. This is an alarming situation. Moderate to severe anxiety being observed in health care professional amidst this pandemic stem from

Table-II: Impact of COVID-19 pandemic on neurosurgeons.

Question	Yes (n) %	No (n) %	*p*-value
Did this pandemic affect your personal life?	75 (67.56%)	36 (32.43%)	<0.001
Did this pandemic affect your social life?	89 (80.18%)	22 (19.81%)	0.01
Did this pandemic affect your mental health?	97 (87.38%)	14 (12.61%)	<0.001
Did this pandemic affect your training activities?	80 (72.07%)	31 (27.92%)	0.02
Do you feel supported educationally in your department?	56 (50.45%)	55 (49.54%)	0.14
Do you feel supported psychologically in your department?	32 (28.82%)	79 (71.17%)	0.01
Has this pandemic affected the number of OPD patients?	74 (66.66%)	37 (33.33%)	0.02
Has this pandemic affected your annual leaves?	88 (79.27	23 (20.72%)	0.01

Table-III: Knowledge of the study population towards COVID-19.

Question	Yes (n) %	No (n) %	*p*-value
Are you familiar with the latest protocols and guidelines of neurosurgery practice during COVID-19 outbreak?	76 (68.46%)	35 (31.54%)	<0.001
Are you satisfied with the measures taken by your department to reduce the risk of transmission of COVID-19 to you?	68 (61.26%)	43 (38.73%)	<0.001
Are you satisfied with the measures taken by your department to reduce the risk of transmission of COVID-19 to other patients?	70 (63.06%)	41 (36.93%)	0.14
Are you aware regarding the concept of tele-medicine and tele-screening and triaging?	64 (57.65%)	47 (42.34%)	0.30
Is tele-medicine an effective way to triage patients and conduct problem-focused evaluations in order to limit office visits to patients during COVID-19 Outbreak?	72 (64.86%)	39 (35.13%)	0.21
Do you use tele-medicine and tele-screening in your department?	62 (55.85%)	49 (44.14%)	0.09

Table-IV: The attitude and practices of the study population.

How initial screening of suspected COVID-19 patients be done?	**(n) %**	***p*-value**
In medical centers with appropriate testing kits	76 (68.46%)	<0.001
In the neurosurgery OPD with a temperature sensor	20 (18.01%)	
On telephone at the time of scheduling appointment	15 (13.51%)	

What treatment should be given during COVID-19 outbreak?			
All procedures including elective procedures	Urgent neurosurgical care	Emergency neurosurgical care	*p*-value
5 (4.50%)	20 (18.01%)	86 (77.47%)	0.01

What would you do if an emergency neurosurgical case comes during a COVID-19 outbreak?			
Deferred until the patient tests negative	Would do it only if proper PPE is available	Would not do it till pandemic ends	*p*-value
76 (68.46%)	21 (18.91%)	14 (12.61%)	<0.001

multiple factors. Postponing elective surgeries is the only rational way forward but the conflicts faced in decision making for urgent and emergent cases is mentally and physically taxing for the neurosurgeons. The need of intervention versus the scarcity of personal protective equipment and resources to sustain critical post operative care of neurosurgical patients is a dilemma. Although lists of cases to be considered emergent have been published by institutes to facilitate this crucial triage[8-10]. But then again there is always the concern of creating more ventilator dependent patients in a situation where already ventilators are required for SARS-CoV-2 patients too. Another important psychological factor is the fact that in line of duty the health care workers themselves have become a potential threat for their loved ones and families, taking home all the viral load they are continuously being exposed to. 87.3% of our respondents have been affected mentally by these taxing challenges. In a similar study conducted by Alhaj *et al* showed that 90.4% of residents' mental health was affected and 100% agreed that their social life has been disrupted[7].

Training activities in teaching hospitals is another aspect of life of residents that has been disturbed by the outbreak[11-13] training has been significantly altered by cessation of elective surgery and the inadequate supply of PPE to keep everyone safe[6]. Although webinars and online learning modalities have been employed to counter this academic challenge but hands-on training being the most important form of learning for surgical skills is vital for a surgical resident. 72.07% of residents agreed that their training has been set back by the outbreak.

49.5% of respondents felt not supported educationally by their department and 71.7% had no psychological support. In a study conducted by jean *et al* 46.1% of the respondents reported that there was 50% operative volume reduction at their institutions[14]. Alhaj *et al* reported agreement of 98.1% of responders on the fact that their training at hospital was affected by pandemic[7].

Lack of measures to support the psychological stress amongst the frontline fighters is very disconcerting in current scenario. Its the need of the hour to establish support groups for psychosocial support of medical staff and encourage to mental heathcare. Administration of institutions and department heads must take the necessary measures to identify the psychological stressors among their employees and find ways to help them in addressing the possible stress factors in order to alleviate their anxiety and depression which is vital for improvement in their performance as well as in their defence against COVID-19 infection since no definite cure has yet been found and effects of anxiety and stress in compromising the immune system are well known[15].

Most of study population (68.4%) was well aware of the protocols and guidelines of practice. But despite being aware of the necessary protective measures availability of required gear is a limiting factor. More than half of neurosurgeons are aware of telemedicine and telescreening modalities and have been using the means effectively for the care of outpatient department. In our survey only 61% were satisfied by the measures taken by their institute to limit spread of infection to other patients and health care professionals. Level 1 protection which includes surgical mask, apron and gloves is must for all clinical activities of evaluation and diagnosis. And level 2 protection for procedures producing small amount of debris and fluid which comprises of N95 masks, gown gloves and eye protection. Level 1 and level 2 protection is available but recommended level of protection for procedures involving use of drills which is basically required in nearly all of emergency neurosurgical procedures is level 3[4,16]. And level 3 protection which includes use of full-face respirators or FFP-3 masks with visors, double gown, double gloves and rubber boots is not universally available. International study by Alhaj *et al* reports 57.7% of their study group had received formal training in doffing and donning PPE before pandemic.

77.4% of our neurosurgeon considered provision of only emergency surgical care to be appropriate strategy during pandemic. 18% said that urgent procedures required to halt progressive deficits that impair quality of life should also be dealt with in time. And 4% suggested continuation of surgical care for all including elective procedures. Alhaj *et al* reported opinion of 42.3% of residents on resumption on elective surgery as positive.

In response to the scenario of provision of emergency procedure 68.4% replied that they would wait for patients COVID status to be cleared before intervention and 18.9% of our study population in contrast to 80% of participants of international study volunteered to proceed without clearance if they are provided appropriate PPE. Whereas 12.6 refused to operate until end of pandemic. None of the participants of alhaj *et al* survey refused to operate at all[7].

Similar results have been observed in a global study conducted on impact of currents pandemic by jean *et al*[14]. and reciprocal effects on behavioural and psychological response has been observed in general population of Pakistan by a study conducted in Karachi by balkhi *et al*[17].

A strategic scheme needs to be established to cater the psychosocial needs of neurosurgical community and proper allocation of resources for emergency neurosurgical care[18]. There should be annual training sessions for proper PPE Donnie doffing techniques. Another aspect that needs attention is the preplanning for management of challenges that will arise in next phase when the delayed elective cases will have to be dealt with once the pandemic is over that may over whelm the health care system all over again.

Disclosure

The article is original and not presented anywhere else.

CONCLUSION

COVID-19 has affected personal, social and educational activities of neurosurgeons; however, majority of neurosurgeons are familiar with the protocols of treating patients during this pandemic and are using tele medicine for triaging patients.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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