DOI: 10.7860/JCDR/2022/53199.16245

Original Article

Health Management and Policy Section

Trends in Hospital Outpatient Department Registrations and Admissions during COVID-19 Pandemic in a Super Speciality Hospital, Delhi, India

AMIT AGGARWAL[1], HARISH CHANDER SHARMA[2], RAKESH YADAV[3]

ABSTRACT

Introduction: Delhi, India's capital, witnessed the first Coronavirus Disease-2019 (COVID-19) case on February 10, 2020, and subsequently three waves of the pandemic due to which the government had to impose lockdown starting March 25. It led to a decrease in patients seeking health care services for non emergency problems. Janakpuri Super Speciality Hospital (JSSH), a three hundred bedded autonomous institute under Delhi Government, also encountered a decrease in patient footfall.

Aim: To identify the changes in trend in Outpatient Department (OPD) registrations and Inpatient Department (IPD) admissions during one year (January 1, 2020 to December 31, 2020) of COVID-19 pandemic in comparison to 2019 and also to analyse the collected data with the publicly available data on daily COVID-19 incidence in Delhi.

Materials and Methods: A retrospective study was done by collecting data from the Janakpuri Super Speciality Hospital, Delhi, India, Medical Record Department from 1st January 2019 to 31st December 2020, for daily OPD visits and IPD admissions. The collected data was analysed with the publicly available data on daily COVID-19 incidence in Delhi. Statistical analysis was performed using Microsoft excel 2017. The non parametric exponential smoothening technique (dampening factor=0.9) was applied over the dot plot graphs.

Results: In 2020, compared to 2019, the daily OPD visits decreased by 37%. After an initial fall with March lockdown, there was a gradual increase in daily load. The OPD load peaked near middle of August 2020, The second big fall in OPD footfall occurred near second wave in September 2020, After that, OPD volume remained low till the 31st December 2020. Similarly, IPD admission volume peaked near the first wave in June 2020. The 2020 IPD admission volume also witnessed a massive decrease of 40.67% compared to 2019 and was maximum in gastroenterology admissions (65.63%).

Conclusion: The study's findings suggest that temporal associations between COVID-19 pandemic and hospital OPD and IPD admissions during 2020. The possibility of increased morbidity and mortality amongst non COVID-19 patients due to the unavailability of timely health care cannot be ruled out. The government should do capacity building to guide patients to identify the best doctor, clinic and hospital nearest to them in case of future pandemics.

Keywords: Coronavirus disease-2019, Hospital services, Inpatient department

INTRODUCTION

Coronavirus Disease-2019 (COVID-19) pandemic ravaged havoc all through the year 2020, and the story is not different in the year 2021 as well [1]. Delhi, India's capital, with population density one of the highest globally, recorded its first case on 10th February 2020 [2]. The country and the city took initial vital and strict public health measure of the forceful lockdown of 68 days from 25th March to 31st May 2020 [3]. All type of public movement, barring certain essential services like health, was restricted. The initial reports suggested that the fear of disease percolated down well in the entire country. This was seen in public behaviour of avoidance to seek health care facilities for non emergency problems and reduce surgeries [4]. The country started unlocking lockdown in a phased manner from 1st June 2020, and has witnessed a tremendous increase in daily case incidence since then [5].

Janakpuri Super Speciality Hospital (JSSH) is a 300 bedded super-speciality care hospital in West Delhi and runs four routine speciality clinics for Cardiology, Nephrology, Neurology and Gastroenterology on an Outpatient Department (OPD) basis. Typically, patients who require care and intervention under direct supervision are admitted to Inpatient Department (IPD) of hospital. However, nephrology ward admissions are for only those patients who require dialysis as a day care procedure. The hospital does not have any emergency or allied Surgical Department. The clinics and the admission services were never under lockdown and thus worked unhindered during the COVID-19 pandemic. Thus, the present study identified how the OPD visits and the IPD admissions changed as the COVID-19 pandemic intensified in Delhi city during 2020.

MATERIALS AND METHODS

A retrospective study was done by collecting data from the Medical Record Department of JSSH, Delhi, India, from 1st January 2019 until 31st December 2020. The data collection was completely anonymised and no ethical approval was taken from Institutional Ethical Committee of the hospital.

Inclusion criteria: The daily census for OPD registration and admission data for each of the only four specialities running in hospital (Cardiology, Neurology, Gastroenterology and nephrology) was included in the study.

Exclusion criteria: Data from other departments except these four (Cardiology, Neurology, Gastroenterology and Nephrology were excluded from the study.

Study Procedure

The daily census for OPD registration and admission data for each of the only four specialities running in hospital (Cardiology, Neurology, Gastroenterology and Nephrology Department) were collected for a total of 297 Working Days (WD). The collected data was analysed with the publicly available data on daily COVID-19 incidence in Delhi [6].

STATISTICAL ANALYSIS

Statistical analysis was performed using Microsoft excel 2017. The non parametric exponential smoothening technique (dampening factor=0.9) was applied over the dot plot graphs. This method computes a different expected value against each observed value by giving statistical weight to penultimate observed and expected values [7]. This, in turn, minimises the effects of outliers and makes dot plot curves visually more interpretable.

RESULTS

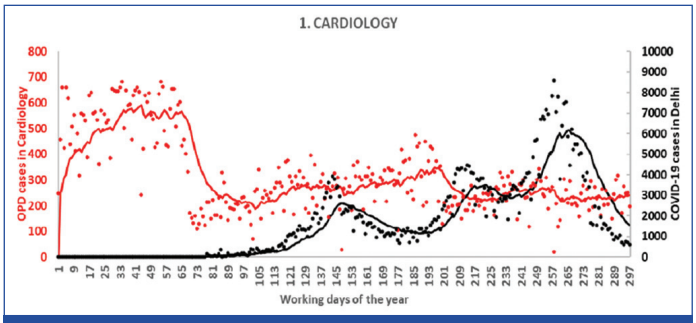
The city witnessed its first COVID-19 case on 10th February 2020 (WD-34) and subsequently saw three pandemic waves. Due to this, the 2019 OPD registration volume of approximately 350,000 (before the COVID-19 pandemic) came down drastically to 220,221 in 2020, a massive 37% fall [Table/ Fig-1]. The fall was seen across all the four specialities (Cardiology, Neurology, Gastroenterology and Nephrology Department), but maximum in Gastroenterology OPD (48.8%).

Speciality	OPD visits in 2019 (a)	OPD visits in 2020 (b)	Fall in OPD visits {(a-b)/a} %	Admissions in 2019 (c)	Admissions in 2020 (d)	Fall in admissions {(c-d)/c} %
Cardiology	154,723	93,669	39.46%	1709	1300	23.93%
Nephrology	37,045	29,416	20.59%	662	386	41.69%
Neurology	106,012	71,335	32.71%	224	173	22.77%
Gastroenterology	50,415	25,801	48.82%	1280	440	65.63%
Total	348,195	220,221	36.75%	3875	2299	40.67%

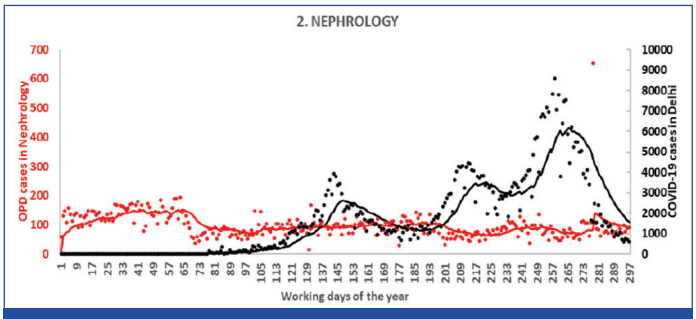
[Table/Fig-1]: Outpatient Department (OPD) and admission volume in the four specialities in the year 2019 and 2020.

Of the three waves of the pandemic, the crest of the first one occurred on June 23, 2020 (WD-143), with 3,947 cases diagnosed in one single day [Table/Fig-2]. The other two peaks came on 16 September (WD-213; 4473 cases) and 11 November 2020 (WD-258; 8593 cases). The city underwent 68 days of continuous lockdown starting from 25 March (WD-71) till 31 May (a day after WD-123). Initially, a massive decline in hospital daily registrations was seen across all the clinics. But later, even before the announcement of the first lockdown unlock in 1st June 2020 (WD-124), all the specialities started showing a gradual increase in daily registrations. This gradual OPD registration increase was slower in nephrology [Table/Fig-3]. Rise in OPD footfall continued till the onset of the subsequent second wave [Table/Fig-2-5]. The daily registrations remained low after that till the year end. Although registrations witnessed a decline during the last two COVID-19 waves, a more considerable decrease in exponential smoothing curve estimates was seen in the second wave.

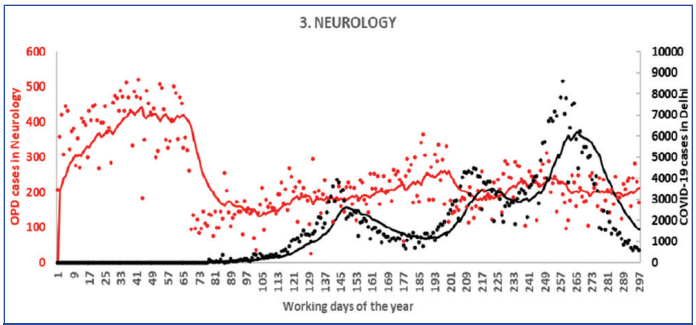
Similar to OPD registrations, the 2020 IPD admission volume also witnessed a massive decrease of 2299 (40.67%) compared to 2019 (3875) and was maximum in gastroenterology admissions (65.63%) [Table/Fig-1]. The initial decline in IPD daily admissions was due to 25 March 2020 lockdown imposition and was observed across the specialities [Table/Fig-6-9]. After that, the admission volume started showing a gradual increase, albeit less pronounced in neurology and peaked near the onset of the first wave on 23 June 2020 (WD-143). In contrast to Neurology, where admission volume showed an increasing trend near the onset of subsequent COVID-19 waves, the remaining specialitie's volume remained either stable or decreased till the year-end.



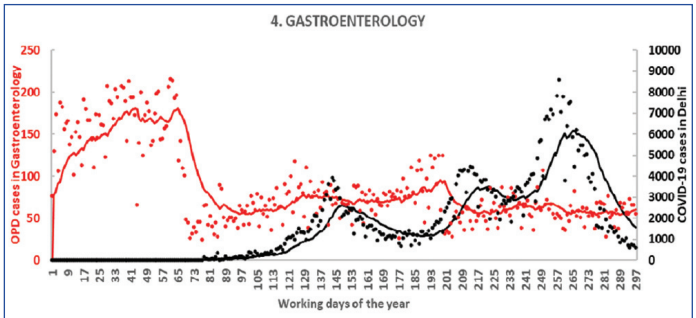
[Table/Fig-2]: Daily Outpatient Department (OPD) visits in Cardiology speciality in the hospital during 297 Working Days (WD) of 2020.



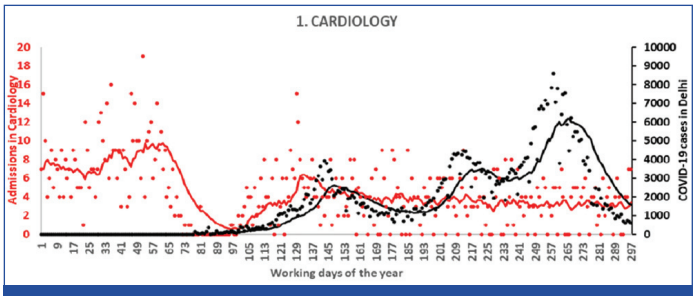
[Table/Fig-3]: Daily Outpatient Department (OPD) visits in Nephrology speciality in the hospital during 297 Working Days (WD) of 2020.



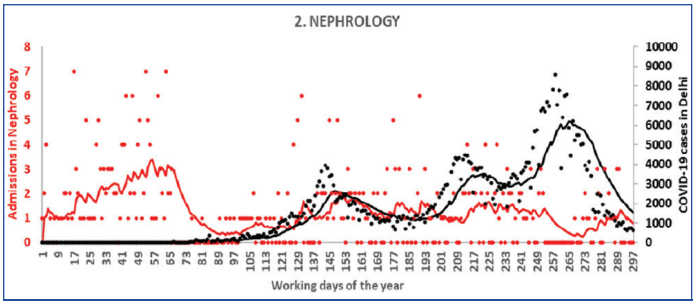
[Table/Fig-4]: Daily Outpatient Department (OPD) visits in Neurology speciality in the hospital during 297 Working Days (WD) of 2020.



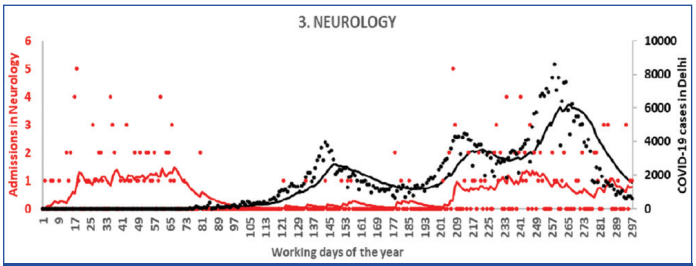
[Table/Fig-5]: Daily Outpatient Department (OPD) visits in Gastroenterology speciality in the hospital during 297 Working Days (WD) of 2020.



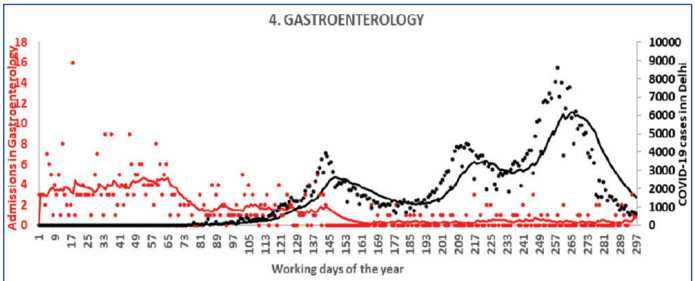
[Table/Fig-6]: Daily admissions in the hospital from the OPD for the Cardiology speciality in the hospital during 297 Working Days (WD) of 2020.



[Table/Fig-7]: Daily admissions in the hospital from the OPD for the Nephrology speciality in the hospital during 297 Working Days (WD) of 2020.



[Table/Fig-8]: Daily admissions in the hospital from the OPD for the Neurology speciality in the hospital during 297 Working Days (WD) of 2020.



[Table/Fig-9]: Daily admissions in the hospital from the OPD for the Gastroenterology speciality in the hospital during 297 Working Days (WD) of 2020.

DISCUSSION

As the COVID-19 pandemic waves appeared with varying intensities in Delhi during the year 2020, the volume of OPD visits and the IPD admissions also fluctuated, albeit less closely for specific periods. Delhi, India's capital, with population density one of the highest globally, recorded its first case on February 10, 2020 [2]. COVID-19 cases did start appearing in Delhi in February and Lockdown was imposed in March, but, India reported the first case much earlier on 27th January 2020. Delhi is a cosmopolitan city wherein people from all states come. Therefore, undercurrent of COVID signs and symptoms must have started in Delhi before February. This could possibly affect OPD and IPD volume in any government setup. This is why data was taken for post COVID-19 from January to December 2020 (COVID-19 first case reporting). The OPD visits decreased by more than 36% in all the specialities. Although, the numbers suddenly plunged from their height in January to the lowest point in March 2020, when the forceful lockdown was imposed, the volume gradually started rising until the onset of second pandemic wave near the beginning of the third week of September 2020. Possible explanations for this temporal association are many. Many of the smaller unaided private city clinics and health care practitioners stopped running their OPD because of a fear of being exposed to COVID-19 and instead shifted to telemedicine [8,9]. Smaller clinics might have also stopped running due to massive financial losses incurred due to lock down, as was reported in a study by Rubin R from Indiana, United States of America (USA) [10].

In the present study, the data shows that the city patients responded well to the national risk mitigation message and the possibility of acquiring an infection. They restricted themselves in presenting to the government run free hospital for the four specialities' critical clinical problems. With annual OPD load decreasing by more than 36%, the hospital's OPD load at the end of 2020 year was nowhere close to end of 2019. This was in line with the entire India figures where the fear of getting COVID-19 infection had percolated down and was seen in concerns about the possibility of long wait times and a sense of civic responsibility to avoid using health care services for not so emergency conditions [11]. The later rise of OPD volume can be seen as necessary requirement of city patients for only significant and meaningful follow-ups. Similar findings were also reported by Mehrotra A et al., from USA [12] wherein the number of visits to ambulatory practices declined nearly 60% by early April after which a rebound was seen in daily OPD numbers. However, this rebound reported one-third lower visits after the easing of pandemic in 2020 than what was seen before the pandemic.

However, a grim aspect of the above situation emerged in dialysis patients' inability to undergo the timely procedure. The dialysis procedures were deferred because of the fear of catching more COVID-19 in immunocompromised states [13]. Daily IPD admission volume also took a plunge with the March lockdown announcement. After that, barring gastroenterology, where admission always remained low, hospital admission rates from the OPD gradually increased until the disease transmission in the city peaked with the onset of second and third waves. A possible explanation for this temporal association is that there was a sense among physicians for higher admission acuity in low patient volume OPD. Although, the present study did not attempt to identify the reasons for admission in every speciality, it does provide insight into the perception of the medical community and the public during the COVID-19 pandemic. The association between OPD visits and IPD admissions by patients seeking care for reasons unrelated to COVID requires further study.

Limitation(s)

The present study's findings are not generable outside the present government run JSSH, Delhi, India, where it has been done because the hospital has only four specialities. Findings may be different for a general hospital, which caters to many other specialities. Lack of emergency services in the hospital could also be reflecting on the overall OPD registration and IPD admission census figures.

CONCLUSION(S)

The present study suggest that as the COVID-19 pandemic intensified from March 2020 to December 2020 and precautionary lockdowns were imposed, temporal associations were observed between COVID-19, OPD visits, and hospital IPD admissions. The possibility of increased morbidity and mortality amongst non COVID-19 patients due to the unavailability of timely health care cannot be ruled out. The Government Health Department and authorities should do capacity building in such a way so that they can provide continued guidance to patients for them to identify the best doctor, clinic and hospital nearest to them in case of pandemics.

REFERENCES

[1] Fang Y, Nie Y, Penny M. Transmission dynamics of the COVID-19 outbreak and effectiveness of government interventions: A data-driven analysis. J Med Virol 2020;92:645-59. Available from: https://doi.org/10.1002/jmv.25750.
[2] Shepherd A. Delhi prepares to hit 500000 covid-19 cases. BMJ. 2020;370:m2817. Available from: https://doi.org/10.1136/bmj.m2817.
[3] Gupta M, Mohanta SS, Rao A, Parameswaran GG, Agarwal M, Arora M, et al. Transmission dynamics of the COVID-19 epidemic in India and modeling optimal lockdown exit strategies. Int J Infect Dis. 2021;103:579-89. Available from: https://doi.org/10.1016/j.ijid.2020.11.206.
[4] BMJ IC. Covid-19: India should abandon lockdown and refocus its testing policy, say public health specialists. BMJ. 2020;370:m3422. Available from: https://doi.org/10.1136/bmj.m3422.
[5] Soni P. Effects of COVID-19 lockdown phases in India: An atmospheric perspective. Environ Dev Sustain. 2021;23:1. Available from: https://doi.org/10.1007/S10668-020-01156-4.
[6] Delhi Govt. Portal: Home n.d. Available from: https://www.delhi.gov.in/ (accessed January 28, 2021).

[7] Holt CC. Forecasting seasonals and trends by exponentially weighted moving averages. Int J Forecast. 2004;20:05-10. Available from: https://doi.org/10.1016/j.ijforecast.2003.09.015.
[8] Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: A systematic review based on current evidence. BMC Public Health. 2020;20. Available from: https://doi.org/10.1186/s12889-020-09301-4.
[9] Al-Jabir A, Kerwan A, Nicola M, Alsafi Z, Khan M, Sohrabi C, et al. Impact of the Coronavirus (COVID-19) pandemic on surgical practice- Part 1. Int J Surg. 2020;79:168-79. Available from: https://doi.org/10.1016/j.ijsu.2020.05.022.
[10] Rubin R. COVID-19's crushing effects on medical practices, some of which might not survive. JAMA. 2020;324:321-23. Available from: https://doi.org/10.1001/JAMA.2020.11254.
[11] Covid-19 fears forcing many to give vital treatments a miss | Latest News Delhi-Hindustan Times n.d. Available from: https://www.hindustantimes.com/delhi-news/many-delaying-treatments-for-fear-of-covid-putting-their-lives-at-risk-say-doctors/story-k5x7qV219rNl3OCv8ckuNI.html (accessed January 5, 2022).
[12] Mehrotra A, Chernew ME, Linetski D, Hatch H, Cutler DA. The impact of the COVID-19 pandemic on outpatient visits: A rebound emerges | Commonwealth Fund n.d. Available from: https://www.commonwealthfund.org/publications/2020/apr/impact-covid-19-outpatient-visits (accessed January 5, 2022).
[13] Hsu CM, Weiner DE. COVID-19 in dialysis patients: Outlasting and outsmarting a pandemic. Kidney Int. 2020;98:1402-04. Available from: https://doi.org/10.1016/j.kint.2020.10.005.

PARTICULARS OF CONTRIBUTORS:
1. Specialist, Department of Microbiology, Janakpuri Super Speciality Hospital Society, Delhi, India.
2. Medical Superintendent, Department of Hospital Administration, Janakpuri Super Speciality Hospital Society, Delhi, India.
3. Medical Officer, Department of Hospital Administration, Janakpuri Super Speciality Hospital Society, Delhi, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Amit Aggarwal,
AA-292, Shalimar Bagh, Delhi-110088, India.
E-mail: amit.aggarwal.microbiology@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Nov 11, 2021
- Manual Googling: Jan 11, 2022
- iThenticate Software: Feb 18, 2022 (4%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? No
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Nov 08, 2021**
Date of Peer Review: **Jan 02, 2022**
Date of Acceptance: **Feb 01, 2022**
Date of Publishing: **Apr 01, 2022**