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RFP Journal of
Hospital Administration

January-June 2022
Volume 6, Number 1

Contents

Original Articles

Quantitative Study to Analyze the Discharge Process among IP Patients in Sun Medical and Research Centre, Thrissur **9**
Shibilamol C Baby

Review Articles

Post Covid Prophylaxis in Adults: A Systematic Review **21**
Ujjwal Sharma, KM Joyti, Anjum Abbasi, S P Subashini

Case Report

Cardiac Complication of Extrapulmonary Tuberculosis **27**
J N Pandit, Karthi, Gokul, Abhishek Yadav, Sudheer Arava

Guidelines for Authors **33**

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Original Article

RFP Journal of Hospital Administration
Volume 6 Number 1, January-June 2022

Quantitative Study to Analyze the Discharge process among IP Patients in Sun Medical and Research Centre, Thrissur

Shibilamol C Baby

How to cite this article:
Shibilamol C Baby/Quantitative Study to Analyze the Discharge process among IP Patients in Sun Medical and Research Centre, Thrissur/RFP Journal of Hospital Administration. 2022;6(1):9-17.

Abstract

National Accreditation Board for Hospitals and Health Care Organizations (NABH) has set a standard of 180 minutes for the completion of the discharge process. Hence, maintaining an acceptable level of discharge time provides competitive edge to the organization. Hospital discharge process is one of the very lengthy procedures. Discharge time taken by hospitals is an important indicator of quality of care and patient satisfaction. The patient as well as his relatives is eager to resume their routine life immediately and any undue delay in the discharge process leads to patient dissatisfaction and takes a toll on image of the hospital, even after a successful and satisfactory treatment. The present study was undertaken to analyze the discharge procedure system in the institution. The main objectives of the study were to explore problems faced by patients and employees during the discharge procedure and to improve the quality of health care facility by reducing average discharge time. The design used for this was comparative design. The setting of the study was Sun Medical Research Centre, Thrissur. Convenient sampling was utilized to collect data from 69 subjects, who meet the inclusion criteria. The tool used for this study was discharge process time analyzing checklist. The study was conducted from 14/3/2022 to 18/3/2022. The collected data were analyzed on the tabular and graphical analysis. The findings of the study revealed that the total average time taken for unplanned discharge was 3:56 hr and the planned discharge was 4:10 hr. While comparing the insurance and non insurance patients, average discharge time was increased among non insurance patient's 4:01 hr and 3:17 hr in insurance patients. In planned discharge, total average time delay was 4:10 hr. Average discharge time was increased among non insurance patient's 4:38 hr and 3:41hr in insurance patients. The most average time delay was observed in discharge summary department (1.56 hr), insurance and bill settlement time (1.43 hr), (1.24 hr) pharmacy department. The study explored the problems faced by patients and employees during the discharge procedure. Findings of the study are useful for the HCO to improve the quality of the institution. The study results are helpful to the quality department to improve the quality, to identify the patient's, employee's problems andcreate an action plan to reduce the problems at the time of discharge. The action plan includes the all department included in discharge procedure.

Keywords: Discharge Process; NABH.

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Received on: 01.05.2022

Accepted on: 01.06.2022

INTRODUCTION

Background of the Study

NABH defines, discharge as a process by which a patient is shifted out from the hospital with all concerned medical summaries ensuring stability. The discharge process is deemed to have started when the consultant formally approves

discharge and ends with the patient leaving the clinical unit.[1] National Accreditation Board for Hospitals (NABH) has set a standard of 180 minutes for the completion of the discharge process. Hence, maintaining an acceptable level of discharge time provides competitive edge to the organization.[2] Hospital discharge process is one of the very lengthy procedures. Discharge time taken by hospitals is an important indicator of quality of care and patient satisfaction. The patient as well as his relatives is eager to resume their routine life immediately and any undue delay in the discharge process leads to patient dissatisfaction and takes a toll on image of the hospital, even after a successful and satisfactory treatment. Delay in discharge of the patient also increases the pressure on beds of the hospital and is bad for both hospitals and the patients. It increases cost to the hospitals and is depressing to the patients. Delayed discharge also increases the patient's exposure to hospital acquired infections. So, effective strategies must be in place to solve this issue.[3]

NEED AND SIGNIFICANCE OF THE STUDY

Inadequacy in discharge planning, preparation of readiness, and unplanned readmissions are closely linked and could cause misutilization of hospital services, creating higher costs to the health care system. The information given before discharge is vital and of great importance for the well being of the patient. Delays in the discharge of the hospital ward patients cause a backlog for new admissions from the Emergency Department, and transfers from the Intensive Care Units and wards.[6] This bottleneck unnecessarily increases troubles in quality of institution and also negatively impacts patient care and satisfaction. Therefore, our internal quality department aimed through this quality improvement project, to decrease the time between discharge orders and patients leaving from each department with satisfaction. We conducted this study to analyze the discharge procedure system of the institution and find out the faults from each department in Sun Medical and Research Centre, Thrissur. The main purpose of the study was to identify barriers; to plan and implement an appropriate multidisciplinary initiative; to measure the impact of the intervention on efficiency of discharge process. The result can help to improve the quality of health care facility.

STAEMENT OF THE PROBLEM

Quantitative study to analyze the discharge process among IP patients in Sun Medical and Research Centre, Thrissur.

OBJECTIVES

- To analyze the discharge procedure system in the institution.
- To explore problems faced by patients and employees during the discharge procedure.
- To improve the quality of health care facility by reducing average discharge time.

ASSUMPTIONS

The average discharge time may negatively increases or positively decreases among the insurance and non insurance patients.

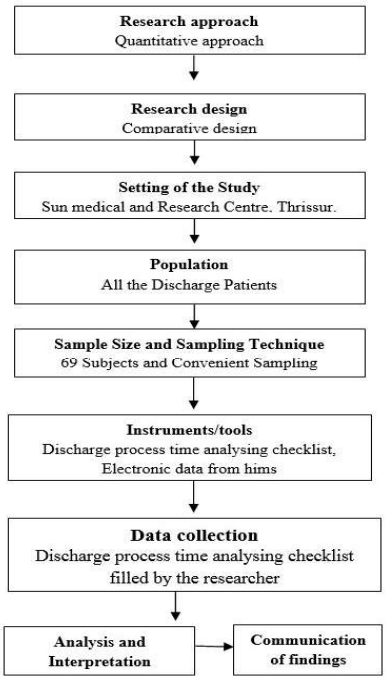
REVIEW OF LITERATURE

A study was carried out in General medicine and General Surgery wards of inpatient department of SKIMS. It was an observational type of study where in all the patients who got discharged in the said wards from 10am to 4pm daily (Except Sundays) were observed for Discharge process including average time taken and the existing Discharge Process in SKIMS was compared with National board of Hospitals and health care organization (NABH) standards and objective elements. The results shows that, A total of 710 Discharged patients were observed during the study period which includes 417 patients from General surgery department and 293 patients from General medicine side. The results shows that the average time taken for discharge process was 240 minutes for those who had a planned discharge and had to pay out of pocket (Self Payment). It was 255 minutes for those who had been discharged against medical advice (DAMA) while it was 270 minutes for below poverty line (BPL) patients who had to exempt hospital charges. The discharge time for all types of discharges was higher when compared to NABH criteria's. The results clearly indicate that average time taken for all types of discharges in SKIMS is more than prescribed NABH criteria. SKIMS as per the observations is following many objective elements of standards AAC 13 and 14 but discharge process and time needs to be defined and documented. The SKIMS should formulate a policy

regarding a discharge process of a hospital wherein steps and time taken should be clearly defined and all measures should be taken in order to adhere to NABH standards.[2]

A study was conducted in the period from January 2013 to July 2014, three process change initiatives were undertaken at a major UK hospital to improve the patient discharge process. These initiatives were inspired by the findings of a study of the discharge process using Soft Systems Methodology. The first initiative simplified time consuming paperwork and the second introduced more regular reviews of patient progress through daily multi disciplinary "Situation Reports". These two initiatives were undertaken in parallel across the hospital, and for the average patient they jointly led to a 41% reduction between a patient being declared medically stable and their being discharged from the hospital. The third initiative implemented more proactive alerting of Social Care Practitioners to patients with probable social care needs at the front door, and simplified capture of important patient information (using a "SPRING" form). This initiative saw a 20% reduction in total length of stay for 88 patients on three wards where the SPRING form was used, whilst 248 patients on five control wards saw no significant change in total length of stay in the same period. Taken together, these initiatives have reduced total length of stay by 67% from 55.8 days to 18.6 days for the patients studied.[5]

METHODOLOGY



Research Apporach

Research approach adopted for the study depends on nature of the problem. A quantitative approach was used in this study

Research Design

Research design selected for this study was comparative design

Variables

Variables are considered for this study werehealth status, disease conditionand financial status of the sample

Setting of the Study

The setting of the study was Sun Medical and Research Centre, Thrissur. It is 150 bedded hospital. The study was conducted at 3 wards (238,268,363) in the hospital.

Population

Populations of the study were all discharge patients.

Accessible Population

Accessible population was all discharge patients who are admitted in 3 wards (238,268,363) in Sun Medical AndResearch Centre, Thrissur.

SAMPLES

All patients who is fulfill the inclusion criteria

Inclusion criteria

- Samples who are admitted in 3 wards (238,268,363) in SMC
- Samples who are available during data collection period
- Samples who are discharged during this time period.

Exclusion criteria

- Samples Who are not available during data collection period

Tools and Technique

The tool of the study includes

Section-A, Basic information about the patient, Section-B Discharge process time analyzing checklist.

DATA COLLECTION PROCESS

The data collection was carried out for a period from 14/3/2022 to 18/3/2022. The formal permission to conduct the study was obtained from NABH coordinator, SMC thrissur. Discharge process time analyzing checklist was used to collect the data from various departments who is included in discharge process. Discharge process time analyzing checklist includesverbal order time of physician, summary documented time by doctor, final correction time from discharge summary dept, IP billing time entered by nurse, IP billing time, insurance clearance time, counter bill settlement time, discharge medicine settlement time from pharmacy, counseling time from CP department, vacate time of patient. The data was collected through the electronic data from HIMS. It helps to enhance the reliability and validity of data collections to reduce bias. Remaining data was collected from corresponding department. Each discharge was systematically analyzed during the date of discharge from the order of physician to vacate time of patient.

PLAN FOR DATA ANALYSIS

The discharge process time analyzing checklist wasreviewed by the researcher. The data's collected from the toolkit was analyzed and sort it into planned and unplanned discharge. Each discharge elements were compared to each other. The time delay between each element was separately calculated and average time was generated according to dates. The average discharge time was organized under two topics (insurance and non insurance discharge).

ANALYSIS AND INTERPRETATION

Organization of the Data

The data were analyzed and interpreted by using thematic analysis. Findings were organized under the following sections.

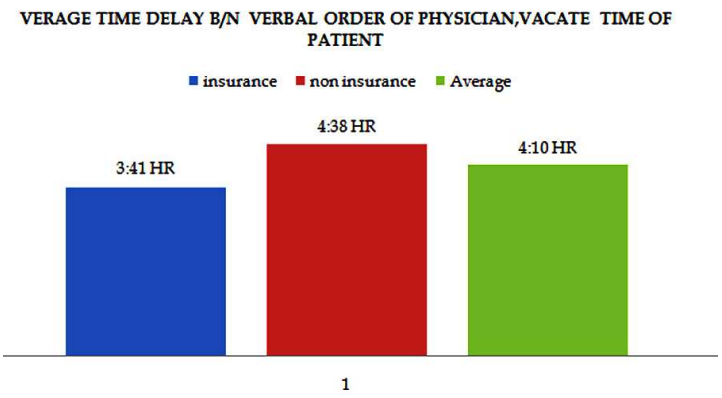
PLANNED DISCHARGE

Average Time Delay B/N Verbal Order of Physician, Summary Documented By Doctor	
24 hr advance	3 HR
Delay on DOD	35 MIN
Advance on DOD	36.66666667 MIN

Average Time Delay B/N Summary Documented By Doctor, Final Correction From Discharge Summary Dept	Average Time Delay B/N Verbal Order By Doctor, Ip Billing Entered By Nurse
Delay 2:11HR	0:14MIN
Advance 1:30HR	2:06HR

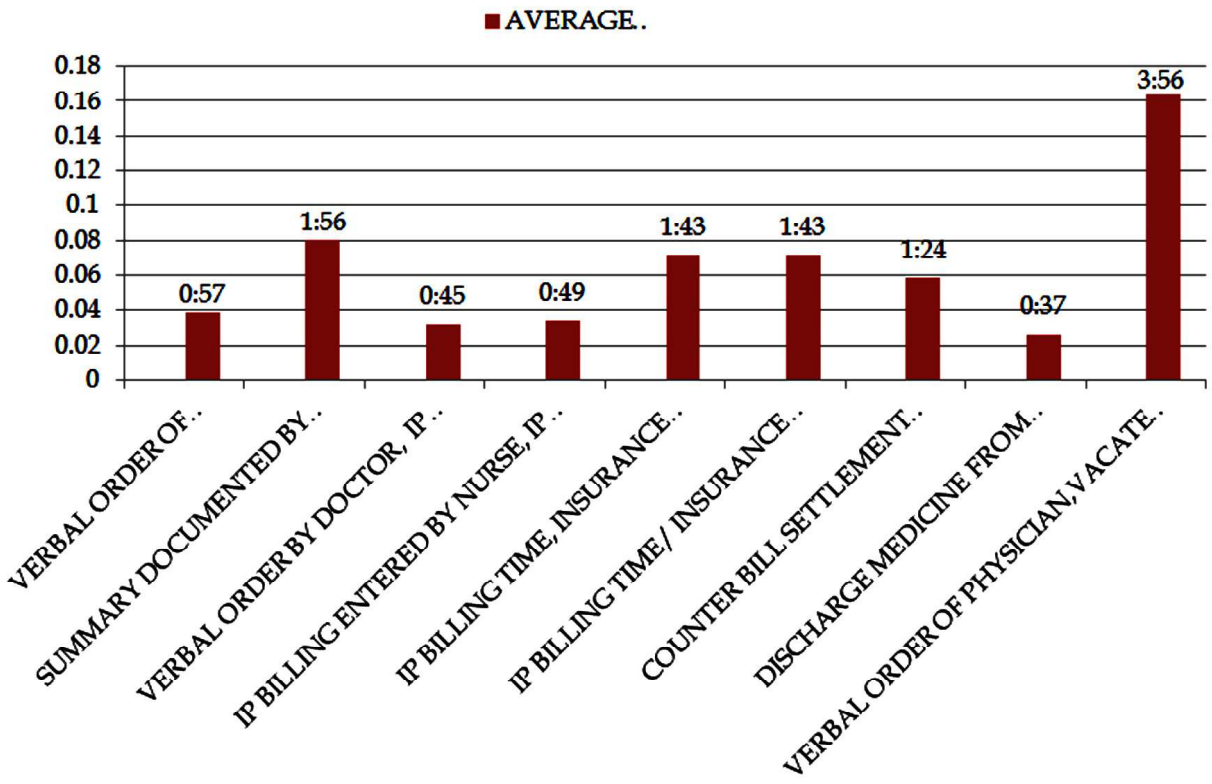
Average Time Delay B/N Ip Billing Entered By Nurse, Ip Billing Time	Average Time Delay B/N Ip Billing Time, Insurance Clearance Time	Average Time Delay B/N Ip Billing Time/ Insurance Clearance Time, Counter Bill Settlement Time	Average Time Delay B/N Counter Bill Settlement Time, Discharge Medicine From Pharmacy	Average Time Delay B/N Discharge Medicine From Pharmacy, Counselling Time From Cp Department
1:22HR	1:48HR	0:59MIN	2:57HR	0:10MIN

Average Time Delay B/N Verbal order of Physician,Vacate Time of Patient	
Insurance	3:41HR
Non insurance	4:38HR
Average	4:10HR



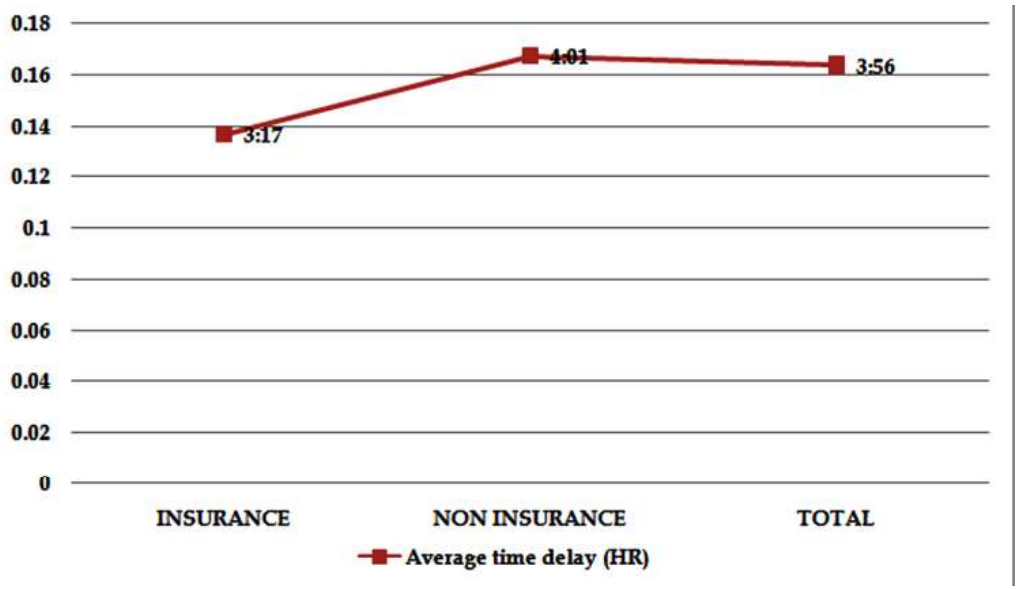
Unplanned Discharge

Date	Average Time Delay B/N Verbal Order of Physician, Summary Documented By Doctor	Average Time Delay B/N Summary Documented By Doctor, Final Correction From Discharge Summary Dept	Average Time Delay B/ Nverbal Order By Doctor, Ip Billing Entered By Nurse	Average Time Delay B/N Ip Billing Entered By Nurse, Ip Billing Time	Average Time Delay B/N Ip Billing Time, Insurance Clearance Time	Average Time Delay B/N Ip Billing Time/ Insurance Clearance Time, Counter Bill Settlement Time	Average Time Delay B/N Counter Bill Settlement Time, Discharge Medicine From Pharmacy	Average Time Delay B/N Discharge Medicine From Pharmacy, Counselling Time From Cp Department	Average Time Delay B/N Verbal Order of Physician, Vacate Time of Patient
14/03/2022	0:52	1:44	0:27	0:45	2:26	1:14	1:50	1:52	4:02
15/03/2022	1:10	2:20	1:04	1:02	1:18	1:44	1:50	0:15	3:44
16/03/2022	0:44	1:44	0:30	0:47	2:01	1:48	1:24		4:21
17/03/2022	1:09	1:58	1:09	0:58	2:09	1:42	1:21	0:09	4:06
18/03/2022	0:48	1:55	0:37	0:34	0:43	2:07	0:36	0:15	3:30
Total Average	0:57 MIN	1:56HR	0:45MIN	0:49MIN	1:43HR	1:43HR	1:24HR	0:37MIN	3:56HR



Date	Insurance	Non Insurance	Total
14/03/2022	4:07	4:00	4:02
15/03/2022	2:41	3:46	3:44
16/03/2022	2:58	4:19	4:21
17/03/2022	3:50	4:22	4:06
18/03/2022	2:51	3:38	3:30
Total	3:17HR	4:01HR	3:56HR

Un planned discharge



1 a. Association ofaverage time delay b/n verbal order of physician and summary documented by doctor with summary documented by doctor and final correction from discharge summary dept

Day	1 and 2	2 and 3		
Day 1	0.52	1.44		
Day 2	1.1	2.2	DF	4
Day 3	0.44	1.44	P -Value	0.992803
Day 4	1.09	1.58		
Day 5	0.48	1.55		

Table 1 a. Shows that statistically, (P value 0.992803) there is no significant relation linking the average time delay b/n verbal order of physician and summary documented by doctor with summary documented by doctor and final correction from discharge summary dept

1 b. Association of average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n summary documented by doctor and final correction from discharge summary dept

Day	1 and 11	2 and 3		
Day 1	4.02	1.44		
Day 2	3.44	2.2	DF	4
Day 3	4.21	1.44	P -Value	0.988129
Day 4	4.06	1.58		
Day 5	3.3	1.55		

Table 1 b. Illustrates that, (P value 0.988129) there is nosignificant association connectingthe average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n summary documented by doctor and final correction from discharge summary dept.

1 c. Association of average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n IP billing entered by nurse and IP billing time.

Day	1 and 11	4 and 5		
Day 1	4.02	0:45		
Day 2	3.44	1:02	DF	4
Day 3	4.21	0:47	P -Value	0.999993
Day 4	4.06	0:58		
Day 5	3.3	0:34		

Table 1 c. Shows that, (P value 0.999993) there is noassociations bounded the average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n IP billing entered by nurse and IP billing time.

1 d. Association ofaverage time delay b/n verbal order of physician and vacate time of patient with average time delay b/n counter bill settlement time and discharge medicine from pharmacy.

Day	1 and 11	7 and 8		
Day 1	4.02	1:50		
Day 2	3.44	1:50	DF	4
Day 3	4.21	1:24	P -Value	0.999904
Day 4	4.06	1:21		
Day 5	3.3	0:36		

Table 1 d. Projects that, (P value 0.999904) there is no

association enclosed by the average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n counter bill settlement time and discharge medicine from pharmacy.

1 e. Association of average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n IP billing time and insurance clearance time.

Day	1 and 11	5 and 6		
Day 1	4.02	2:26		
Day 2	5.02	3:26	DF	4
Day 3	6.02	4:26	P -Value	0.999994
Day 4	7.02	5:26		
Day 5	8.02	6:26		

Table 1 e. Shows that, (P value 0.999994) there is no association linking the average time delay b/n verbal order of physician and vacate time of patient with average time delay b/n IP billing time and insurance clearance time.

RESULTS

Unplanned Discharge

- In accordance with the total average time taken for unplanned discharge was 3:56 hr and the planned discharge was 4:10 hr.
- The most average time delay was observed between summary documented time by doctor and final correction time from discharge summary dept that was 1:56 hr.
- There was an equal distribution of time delay 1:43hr among IP billing time and insurance clearance time. Similarly between IP billing time/insurance clearance time and counter bill settlement time.
- 1:24 hr time delay was displayed between counter bill settlement time and discharge medicine settlement time from pharmacy.
- Whereas the average time delay among verbal order time of physician and summary documented time by doctor was 0:57min, 0:49 min between IP billing time entered by nurse and IP billing time.
- Correspondently, average time delay between verbal order time by doctor and IP billing time entered by nurse was 0:45min.
- The least time delay was shown in between 2 elements, discharge medicine settlement time from pharmacy and counseling time from CP department that was 0:37 min.
- While comparing the insurance and non insurance patients from 14/03/2022 to 18/03/2022, average discharge time was increased among non insurance patient's 4:01 hr and 3:17 hr in insurance patients by comparing NABH policy.

Planned Discharge

- In the category of planned discharge, total average time delay was 4:10 hr. Discharge time was elevated among non insurance patient's 4:38 hr whereas 3:41hr in insurance patients.
- With the reference to the average time delay among verbal order time of physician and summary documented time by doctor. They documented the discharge summary 24 hr in advance for only 3 patients out of 7 planned discharges. 35 min advance on the day of discharge in some cases and 36.6 min delayed to document the summary in few cases.
- Average time delay was observed between last doctors rounds and final correction time from discharge summary dept, that was documented 1:30 hr in advance and delayed about 2:11hr.
- According to the average time delay between verbal order by doctor, IP billing entered time by nurse was 14 min and 2:06 hr in advance.
- The average time delay between IP billing entered time by nurse and IP billing time was 1:22 hr, whereas 1:48 hr time delays among IP billing time and insurance clearance time.
- 59 min was delayed between 2 departments that were IP billing time/insurance clearance time and counter bill settlement time. But the counter bill settlement time and discharge medicine settlement time from pharmacy was 2:57hr and the least 10 min time delay among pharmacy and CP department.

DISCUSSION

- Institution must implement the proper unidirectional plan for both planned and unplanned discharge.
- The communication among each department who is included in the

discharge procedure must be improved.

- Proper documentation
  - ❖ Doctors verbal order of discharge by nurse
  - ❖ patient vacating time documented in nurse's progress note and handover report
  - ❖ IP bill documentation by nurses
- Supervision and auditing must be improved by in charges to reduce wrong documentation and early identification of errors.
- Proper plan of discharge from doctor's side is a helpful decision to improve the quality of discharge procedure.
- Division of work must be implemented in pharmacy and discharge summary department.
- Doctors initiates to give summary correction in between the OP patients consultation.
- Doctors should cooperate with the discharge summary process by giving correction on time and make sure the finalization of summary.
- Doctors must use the eligible handwriting and the medicine should write in capital letters.
- Give preference to LAMA, insurance, death cases and should be communicated to other department.
- Nurses make sure the clients are returning their medicine before 5 pm. It could reduce the rush in billing section after 5 pm.
- Reduce the staff shortage of pharmacy is a good concern to manage the busy schedule in pharmacy.
- One staff is appointed to give special attention to the discharge medicine settlement in afternoon section to smooth completion of discharge medicine billing.
- Previous IP pharmacy slot can converted in to discharge medicine counter or the discharge medicine settlement process was shifted to IP pharmacy.
- Proper staff management must be implemented in pharmacy.
- Most important need of a pharmacist is rechecking and dispensing the medicines, so the other staff can concentrate the remaining duties.
- Nurse can communicated the proper information about purchase return, discharge medicines (which medicine, amount of medicines they purchase) to bystander. It can reduce the confusion of clients during purchasing and minimize the time in pharmacy.
- Most of the patients are didn't consult the CP department. Nurse must educate about the importance of CP counseling and the clients didn't get enough time to cover that department also because of the delayed discharge process.

SUMMARY

The present study was undertaken to analyze the discharge procedure system in the institution. The main objectives of the study were to explore problems faced by patients and employees during the discharge procedure and to improve the quality of health care facility by reducing average discharge time. The design used for this was comparative design. The setting of the study was Sun Medical Research Centre, Thrissur. Convenient sampling was utilized to collect data from 69 subjects, who meet the inclusion criteria. The tool used for this study was discharge process time analyzing checklist. The study was conducted from 14/3/2022 to 18/3/2022. The collected data were analyzed on the tabular and graphical analysis. The findings of the study revealed that the total average time taken for unplanned discharge was 3:56 hr and the planned discharge was 4:10 hr. While comparing the insurance and non insurance patients, average discharge time was increased among non insurance patient's 4:01 hr and 3:17 hr in insurance. In planned discharge, total average time delay was 4:10 hr. Average discharge time was increased among non insurance patient's 4:38 hr and 3:41hr in insurance patients. The most average time delay was observed in discharge summary department and pharmacy department.

CONCLUSION

The study explored the problems faced by patients and employees during the discharge procedure. Findings of the study are useful for the HCO to improve the quality of the institution. The study results are helpful to the quality department to improve the quality, to identify the patient's, employee's problems and create an action plan to reduce the problems at the time of discharge. The

action plan includes the all department included in discharge procedure.

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Review Article

RFP Journal of Hospital Administration
Volume 6 Number 1, January-June 2022

Post-Covid Prophylaxis in Adults: A Systematic Review

Ujjwal Sharma[1], KM Joyti[2], Anjum Abbasi[3], S P Subashini[4]

How to cite this article:
Ujjwal Sharma, KM Joyti, Anjum Abbasi, et al./Post-Covid Prophylaxis in Adults: A Systematic Review/RFP Journal of Hospital Administration. 2022;6(1):21-24.

Abstract

The COVID-19 pandemic has resulted in a growing population of individuals with a wide range of persistent symptoms after acute SARS-CoV-2 infection. This comprises patients with symptoms that develop during or after COVID-19, continue for ≥4 weeks, and are not explained by an alternative diagnosis. Several terms have been used to describe prolonged symptoms following COVID-19 illness, such as "post-COVID conditions," "long COVID," "post-acute sequelae of SARS-CoV-2 infection (PASC)," "post-acute COVID-19," "chronic COVID-19," and "post-COVID syndrome." Whether the constellation of symptoms represents a new syndrome unique to COVID-19 or if there is overlap with the recovery from similar illnesses has not been determined.While most patients with mild acute COVID-19 disease are expected to recover quickly (e.g., two weeks), a longer recovery should be expected in those with moderate to severe acute disease (e.g., two to three months, sometimes longer in those who survive critical illness). The wide variability in time to symptom resolution likely also depends upon premorbid risk factors as well as illness severity during acute COVID-19.During the initial follow-up evaluation, we obtain a comprehensive history of the patient's COVID-19 illness, including the illness timeline, duration and severity of symptoms, types and severity of complications, COVID-19 testing results, and any management strategies. The need for laboratory testing is determined by illness severity, prior abnormal testing during their illness, and current symptoms. We do not routinely re-test patients for active infection with SARS-CoV-2 at the time of follow-up outpatient evaluation. Instead, we follow a non-test-based approach to removing infectious precaution.

Keywords: Prophylaxis; Epidemic; Steam Inhalation.

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Received on: 07.06.2022

Accepted on: 04.07.2022

INTRODUCTION

In Dec 2019, a novel pathogen emerged, and within weeks, led to the emergence of the biggest global health crises seen to date. The virus called 'SARS-CoV-2', causes coronavirus disease which was named 'COVID-19' by the World Health Organization (WHO). The speedy spread of this infection globally became a source of public worry and several unknowns regarding this new pathogen created a state of panic. Mass media became

the major source of information about the novel coronavirus. Much like the previous pandemics of SARS (2003), H1N1 (2009), and MERS (2012), there were various prophylaxis found in the adults. In this review, we analyze the post Covid prophylaxis in adults, and make scientific inferences. The COVID-19 pandemic highlights multiple social, cultural, and economic issues arising from the media's arguable role.[1]

From a healthcare perspective, infection due to the novel coronavirus SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) and the ensuing syndrome called COVID-19 (coronavirus disease 2019) represents the biggest challenge the world has faced in several decades. Particularly worrisome are the high contagiousness of the virus and the saturation of hospitals' capacity due to overwhelming caseloads. Non-pharmaceutical interventions such as quarantine and inter-personal distancing are crucial to limiting the spread of the virus in the general population, but more tailored interventions may be needed at an individual level on a case-by-case basis. In this perspective, the most insidious situation is when an individual has contact with a contagious subject without adequate protection. If rapidly recognized afterwards, this occurrence may be promptly addressed through a post-exposure chemoprophylaxis (PEP) with antiviral drugs. This strategy has been implemented for other respiratory viruses (influenza above all) and was successfully used in South Korea among healthcare workers against the Middle East respiratory syndrome (MERS) coronavirus, by providing people who were exposed to high-risk contacts with lopinavir-ritonavir plus ribavirin. Initial experiences with the use of hydroxychloroquine to prevent COVID-19 also seem promising. Post-exposure chemoprophylaxis might help mitigate the spread of SARS-CoV-2 in the current phase of the COVID-19 pandemic.[2]

DEFINITION

The World Health Organization (WHO) defined the coronavirus disease 2019 (COVID-19), which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), as a public health emergency of international concern.[1] The spread of COVID-19 is reaching alarming figures in many countries. As of 2 May, 2020, 3,267,184 cases of COVID-19 have been confirmed worldwide. Overall, more than 229,971 deaths have been reported thus far, with a case fatality rate of about 7%. In such a situation, it is essential to forecast the epidemic trend in order to take adequate healthcare measures.[3] The attack rate (AR) (i.e., the percentage of exposed patients who will eventually become infected) is a metric that may help to estimate this trend. The AR of SARS-CoV2 is still a matter of debate. The WHO reported an AR of about 3%–10% in household contacts of SARS-CoV-2 patients in the Guangdong Province of China, which is similar to that of influenza viruses (about 10%). In the absence of a specific vaccine, the strategy of epidemic containment lays mainly in the isolation of both cases and contacts and in social distancing of the entire population. Many countries have taken a series of exceptional containment measures, including locking down entire cities. These measures have high social and economic costs but are necessary to avoid the potential collapse of national health systems.[4]

In this context, a post-exposure prophylaxis (PEP) approach may help to reduce the spread of the COVID-19 epidemic. This procedure consists of the administration of drugs to a subject who has been exposed to an infected patient, in the attempt to reduce the risk of becoming infected. The drugs administered are often the same drugs used to treat patients. This strategy is not novel. Indeed, it is well established in the setting of acute viral respiratory infections. For example, oseltamivir and zanamivir, two antivirals used to treat flu symptoms, are administered to exposed subjects to reduce the risk of secondary cases.[5] In a meta-analysis, oseltamivir and zanamivir prevented flu symptoms recurrence in 67%–89% of subjects who underwent PEP. With respect to the coronavirus responsible for the SARS epidemic, no pharmacological prevention strategies were implemented beyond non-specific measures as active symptom monitoring or home quarantine in some countries in 2002–2004. On the other hand, in the setting of the coronavirus responsible for the Middle East respiratory syndrome (MERS), a study conducted in South Korea evaluated whether PEP was effective in preventing MERS in healthcare workers (HCWs) after unprotected exposure to infected patients. The study enrolled 22 HCWs receiving ribavirin plus lopinavir/ritonavir within 80 h (median 36 h) of unprotected exposure in the previous 14 days. No HCW in the PEP arm contracted MERS versus 6/21 cases in the control (non-PEP) arm (0% vs. 28.6%, $p = 0.009$). Overall, 21/22 HCWs undergoing PEP experienced adverse effects, but all were mild. Moreover, there were no discontinuations, and the risk/benefit ratio was considered reasonable.[6]

Regarding COVID-19, a study from South Korea evaluated the efficacy and tolerability of a PEP strategy using hydroxychloroquine, which was

administered to 211 persons (189 patients and 22 HCWs) who were potential contacts of the index patient, a hospital social worker. The drug was administrated at a dose of 400 mg/die for the period of quarantine (14 days) within a median of 58 h after the detection of the index case. The type of exposure was classified as high-risk exposure in nine cases. PEP was completed in 97% of subjects without serious events. The most common symptoms associated with the drug were diarrhea and skin rash. No subject tested positive at the end of quarantine period. However, no definitive conclusions may be drawn from this study without a control arm.[7]

To date, there is no approved treatment for COVID-19. Several trials are now evaluating the effects of various types of COVID-19 treatment but, to our knowledge, only a few studies have been designed to evaluate a prophylactic approach in COVID-19.[8]

Given the worldwide spread of the COVID-19 epidemic, the lack of treatment and the very promising results of the MERS study, it seems reasonable to evaluate whether a PEP approach could reduce the spread of the infection. However, several aspects remain to be established before conducting such a trial, including the drug to administer, the interval between exposure and PEP onset, as well as the dosage and the duration of administration. The drug to use should be one of those currently under study, namely lopinavir/ ritonavir, chloroquine, remdesivir, darunavir/ ritonavir, ribavirin, arbidol, neuraminidase inhibitors, peptide (EK1), and RNA synthesis inhibitors. Although these drugs were developed for a vast array of treatments, they are now being repurposed to counter COVID-19 based on potential in vitro efficacy.[9]

SCOPE

This document provides an integrated holistic approach for managing patients who have recovered enough from COVID for care at home. It is not meant to be used as preventive / curative therapy. The recovery period is likely to be longer for patients who suffered from more severe form of the disease and those with pre-existing illness.

POST-COVID FOLLOW UP PROPHYLAXIS

- At individual level
- Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing). • Drink adequate amount of warm water (if not contra-indicated).
- Take immunity promoting AYUSH medicine (details of medicines and their dosage is at Annexure I) - To be practiced and prescribed by at qualified practitioner of AYUSH. If health permits, regular household work to be done. Professional work to be resumed in graded manner.
- Mild/ moderate exercise & Daily practice of Yogasana, Pranayama and Meditation, as much as health permits or as prescribed.
- Breathing exercises as prescribed by treating physician. tolerated.
- Daily morning or evening walk at a comfortable pace
- Balanced nutritious diet, preferably easy to digest freshly cooked soft diet.
- Have adequate sleep and rest.
- Avoid smoking and consumption of alcohol.
- Take regular medications as advised for COVID and also for managing comorbidities, if any. Doctor to be always informed about all medicines that the individual is taking (allopathic/AYUSH) so as to avoid prescription
- Self-health monitoring at home temperature, blood pressure, blood sugar (especially, if diabetic), pulse oximetry etc. (if medically advised)
- If there is persistent dry cough/ sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.

Look for early warning signs like high grade fever, breathlessness, SpO_2 < 95%, unexplained chest pain, new onset of confusion, focal weakness.[10]

AT THE LEVEL OF COMMUNITY

- Recovered individuals to share their positive experiences with their friends and relatives using social media, community leaders, opinion leaders, religious leaders for creating awareness, dispelling myths

and stigma.

- Take support of community based self-help groups, civil society organizations, and qualified professionals for recovery and rehabilitation process (medical, social, occupational, livelihood)
- Seek psycho-social support from peers, community health workers counsellor. If required seek mental health support service. Participate in group sessions of Yoga, Meditation etc. while taking all due precautions like physical distancing.[11]

IN HEALTHCARE FACILITY SETTING

- The first follow-up visit (physical/ telephonic) should be within 7 days after discharge, preferably at the hospital where he/she underwent treatment.
- Subsequent treatment/follow up visits may be with the nearest qualified allopathic/ AYUSH practitioner/medical facility of other systems of medicine. Poly-therapy is to be avoided due to potential for unknown drug-drug interaction, which may lead to Serious Adverse Events (SAE) or Adverse Effects (AE).
- The patients who had undergone home isolation, if they complain of persisting symptoms, will visit the nearest health facility.
- Severe cases requiring critical care support will require more stringent follow up.

Another issue is the design of the study. A high-quality randomized controlled trial (RCT) would reveal whether the PEP strategy is effective or not in containing COVID-19. A potential example is an ongoing RCT from Spain. However, such a design might be prone to distortions, such as contamination and attrition bias; moreover, a large sample size is required, and results cannot be obtained in a timely fashion. As an alternative, in countries with a high burden of cases, a study comparing the attack rate before and after PEP onset in the area under study may provide initial proof of efficacy more rapidly. Potential enrollees would be people who are in contact with COVID-19 patients, individuals already identified by health authorities, or HCWs after unprotected exposure to COVID-19 patients. In ordinary times, such a study should follow proof of in vitro and in vivo activity of the drug and its therapeutic efficacy. In the present exceptional times, any promising approach should be urgently exploited to contain the epidemic.[12]

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1.	Place of Publication	:	Delhi
2.	Periodicity of Publication	:	Quarterly
3.	Printer's Name	:	**Dinesh Kumar Kashyap**
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4.	Publisher's Name	:	**Dinesh Kumar Kashyap**
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I, **Dinesh Kumar Kashyap**, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-

(Dinesh Kumar Kashyap)

Cardiac Complication of Extrapulmonary Tuberculosis

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How to cite this article:
J. N. Pandit, Karthi, Gokul, et al./Cardiac Complication of Extrapulmonary Tuberculosis/RFP Journal of Hospital Administration. 2022;6(1):27-31.

Abstract

Among communicable diseases, tuberculosis (TB) is the major cluster causing mortality in young patients. WHO reported a global estimation of 10 million people fell ill with tuberculosis (1.5 million fatalities in 2020), and India alone contributed about26%.The incidence of Extra pulmonary Tuberculosis (ETB) is about 15% of all TB cases in India. Central nervous system (CNS) tuberculosis accounted for approximately 1% of total tuberculosis. TB is a rapidly progressive and fatal disease if left untreated. The progression of the disease and the occurrence of complications vary from patient to patient. Here the authors present a case of a young adult who presented with acute onset of fever and headache and she expired within a span of 31 days after the symptoms began. The novelty in the case is that an undiagnosed rare cardiac complication of extra pulmonary tuberculosis was diagnosed at autopsy. The investigations prior to her death didn't indicate TB, but the treating physician had suspected ETB. The autopsy examination and histopathological examination supported the physician's diagnosis. The authors had deliberated the pathogenesis of the cardiac complication of extra pulmonary tuberculosis contributing to the death of the deceased.

Keywords: Extra pulmonary tuberculosis, Tuberculous meningitis, Tuberculous pericarditis, Anti tubercular therapy, Mediastinal lymphadenopathy.

INTRODUCTION

India contributes about one-fourth of the total population of tuberculosis cases worldwide. The most common type of tuberculosis is pulmonary tuberculosis. The incidence of ETB is about 15% of all TB cases in India while central nervous system tuberculosis (CNS-TB) is considered a rare presentation in young adults.[1-3] CNS-TB is a type of extra pulmonary tuberculosis that accounts for approximately 1% of TB cases.[3] Tuberculosisis commonly caused by Mycobacterium Tuberculosis that remains latent inside the body for a long period. This latent or inactive mycobacterium remains silent and highly stabilized. Even though the organism had colonized the extra pulmonary organs, the affected patients exhibit minimal symptoms. In the event of immunosuppression, latent tuberculosis is triggered thereby exhibiting nonspecific symptoms. This creates confusion for the treating physicians to initiate the appropriate treatment considering the side effects of the anti-tuberculosis drugs since the clinical investigations are highly unreliable in the initial changes.[4] This is one of the reasons for less reporting of TB complications even though it has a high mortality rate due to delay in arriving at a diagnosis. In autopsies, residual changes like scars and limited small calcified foci or abscesses are observed. Such findings are seen when a case is registered as a medico legal case (MLC) due to the sudden death of the patient. The authors report a case that presented with sudden onset altered sensorium and expired within a span of 31 days. The novelty in the case is to highlight the mismatch between the lab investigation (biochemical, microbiological) and the clinical presentation. At

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Received on: 11.06.2022
Accepted on: 04.07.2022

autopsy, the gross findings and histopathological examination supported the treating physician's diagnosis. The present case reinforced the fact that rapid progression, delayed presentation, and confusion in arriving at the diagnosis of tuberculosis could lead to mortality in patients.

CASE REPORT

A recently married 23 years old female, presented with a history of weight loss for a few months. Later, the patient got admitted to a private hospital after sustaining a fall due to a sudden collapse due to an altered sensorium while working at her house. General examination and systemic examination were normal. Hence, symptomatic treatment was started along with clinical evaluation by sending samples for relevant tests.

CLINICAL FINDINGS

On clinical evaluation; the serological parameter was within normal limit except for mild anemia (Hb 11.4 gm/dl), lymphopenia (16.6%; Normal 20-40%), and elevated ESR level(30 mm in 1st hour). Dengue NS1 antigen assay, malaria parasite, Antinuclear antibody (ANA), and Anti Double-Stranded DNA (Anti Ds DNA) were negative. She was positive for antibody to S. Paratyphi A on the Widal test. RT-PCR for SARS-COV-2 RNA was negative from the nasopharyngeal swab. Urine showed normal routine and negative culture and sensitivity test. The blood smear showed no acid-fast bacilli on Zein Nielsen staining. The Cerebrospinal Fluid analysis was negative for Cryptococcus with India Ink staining and Gene XPERT (NAAT) was negative for Mycobacterium Tuberculosis.

The Cerebrospinal Fluid was turbid with mild neutropenia and lymphocytopenia, high protein (192 mg/dl; Normal 15 – 45 mg/dl), low glucose (17.93 mg/dl; Normal 40-70 mg/dl), elevated LDH (43 U/L; Normal less than 40) and normal ADA (5.5 U/L; Normal less than 9 U/L) level. The CSF culture for bacterial growth was negative and no resistance was detected for rifampicin. The chest X-ray was normal. MRI brain showed areas of meningeal inflammation likely meningoencephalitis. There were focal areas of diffusion restriction seen in bilateral basal ganglia suggestive of acute patchy infarcts. EEG showedan abnormal awake study suggestive of diffuse cerebral dysfunction with intermittent generalized epileptic form discharges.

Antiviral and empirical anti tubercular therapy (ATT) was started four days after admission and a high dose of pulse steroid was given simultaneously based on the clinical evaluation. Neurological status improved marginally following two days of treatment. She was discharged on advised to take Anti Tubercular drugs regularly. After 11 days of discharge, she was brought dead to the hospital and hence a medico-legal autopsy was conducted as per the relevant provisions of CrPC and IPC.

AUTOPSY FINDINGS

The deceased was a poorly nourished and thin-built adult female weighing 42kg. There was multiple yellow-colored purulent collections present involving the interpeduncular fossa and periventricular region of the base of the brain (fig 1a, 1b & 1c). The costal surface of the right lung was partially adherent to the chest wall. A white-colored mass firm in consistency measuring 5 cm X 3 cm X 2 cm was present in the hilar region under the bifurcation of the trachea (fig 2). The pericardial sac was adherent to the anterior surface of the left ventricle and showed flakes of white-colored pus (fig 3a). The histopathological examination of the pericardium and heart showed thickened pericardium with caseous necrosis of the myocardium (fig 3b). The cause of death was given as extra pulmonary tuberculosis and its complications.

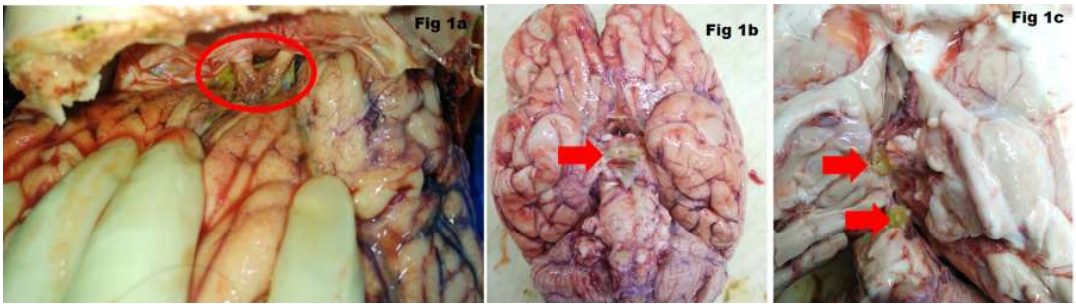


Fig 1a: Yellow-colored pus in the interpeduncular fossa surrounding the optic chiasma.

Fig 1b: Yellow-colored pus over the mamillary body.

Fig 1c: Yellow-colored pus in the fourth ventricle.

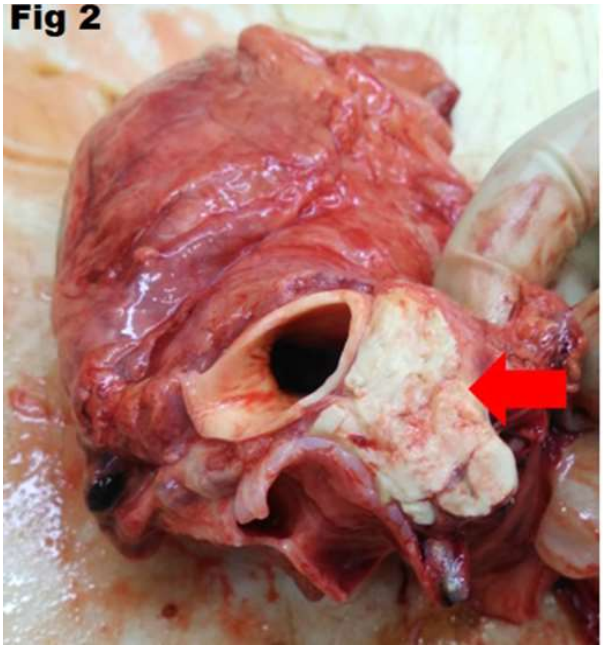


Fig 2: Hilar Lymphadenopathy at the level of bifurcation of the trachea.

Fig 3a: 10% formalin-fixed specimen of the heart showing the affected myocardium along the entire length.

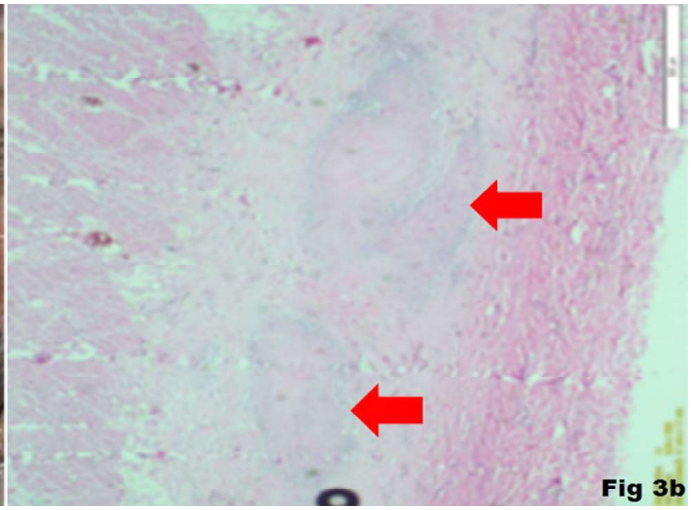


Fig 3b: Inflamed and Thickened pericardium with underlying granulomatous inflammation of the myocardium (red arrows). [H & E staining, 10x]

DISCUSSION

TB is a multisystem disease with innumerable 'presentations varying' from individual to individual and high mortality among young age individuals. It can affect almost any organ or tissue and less frequently involves hair and nails.[5] The survival period is variable and various factors influence the same. Immunosuppression is considered a triggering factor to supervene latent TB. The mean survival days of patients who died due to TB was 53.6 days (range 1–229) and about 50% of the patients died within the first 32 days as concluded by Erbes *et al*.[4] A study conducted in North Taiwan concluded most of the TB-related deaths occurred within a median survival of 20 days.[5] The survival time in the present case was 16 days since the first day of her altered sensorium. The diagnosis of Tuberculous Meningitis (TBM) clinically could be made after considering the following factors as stated by Abdelmalek et al.[6] a

1 Signs and symptoms suggestive of subacute meningitis where CSF glucose levels are low with a good response to specific anti-tuberculous treatment;

2 A positive result after evaluation of the smear for acid-fast bacilli and/or positive CSF or sputum culture for Mycobacterium tuberculosis

3 The radiological findings support TBM on cerebral MRI and/or cerebral CT in a case with lymphocytic subacute meningitis.

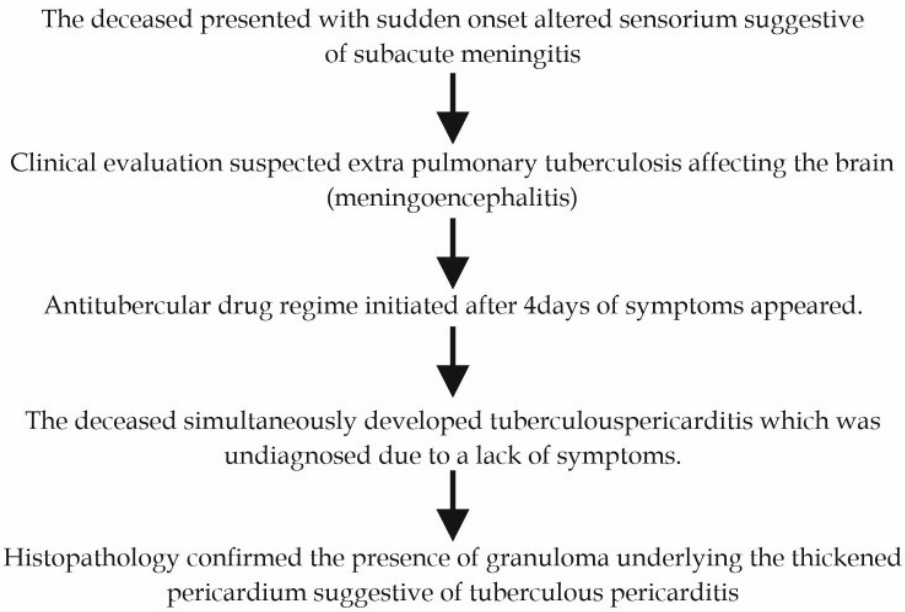
Kent SJ et al. concluded that the clinical presentation mostly is subacute with cranial nerve palsies, hemiparesis, and impaired consciousness.[7] In the present case, there were nonspecific presenting complaints like weight loss for months and sudden onset of altered sensorium, and the clinical evaluation suggested a scenario similar to subacute meningitis. The MRI brain confirmed the presence of meningeal inflammation and thereby, diagnosing meningoencephalitis. Thus, the present case abided by criteria 1 and 3 mentioned by Abdelmalek et al. except for the smear-positive.

Pericardial infection with Mycobacterium tuberculosis occurs as an extension of infection from the lung or tracheobronchial tree, adjacent lymph nodes, spine, sternum, or via the miliary spread. The primary focus of infection is rarely found as it occurs due to the reactivation of the disease. There are four pathological stages of tuberculous pericarditis according to studies.[8,9]

1. Fibrinous exudation with polymorphonuclear leucocytosis, abundant mycobacteria, and early granuloma formation with the loose organization of macrophages and T cells
2. Serosanguineous effusion with lymphocytic exudate and high protein concentration; tubercle bacilli present in low concentrations
3. Absorption of effusion with granulomatous caseation and pericardial thickening with subsequent fibrosis
4. Constrictive scarring; fibrosing visceral and parietal pericardium contracts on the cardiac chambers and may become calcified, leading to constrictive pericarditis, which impedes diastolic filling.

Tuberculous pericarditis progresses from one phase to the next. The initial phase is identified by biopsy or autopsy. The biopsy findings are isolated granulomas in the pericardium as seen in the present case. The visceral pericardial thickening is due to healing with fibrosis and calcification, as a result of treatment with anti-tubercular drugs. This can cause constriction of pericardium, and the collection of the pericardial fluid inside the pericardial cavity leads to cardiac tamponade.[10,11] However, extrapulmonary complications of TB involving the heart are less commonly observed with only 0.5%. The common finding observed is tuberculous pericarditis which manifestsas pericardial thickening (>3mm), often associated with mediastinal lymphadenopathy (LAN).[12] The present case depicted hilar lymphadenopathy and pericardial thickening which was later confirmed as pericarditis in the histopathology examination. This finding is less commonly reported and is of academic interest.

FLOW CHART OF PATHOGENESIS IN THE PRESENT CASE



CONCLUSION

This case report highlights the atypical presentation of extra pulmonary tuberculosis. Since the disease doesn't have a unique presentation, the initiation of treatment is purely based on suspicion. This will help the treating physicianto better understandthe various presentations of the disease so as to initiate the appropriate treatment avoiding the progress of the disease. The administration of appropriate treatment subsequently helps in reducing the mortality rate due to the tuberculosis.

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