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Original Research Article

Delay in final opinion of autopsy requiring Histo-pathological and chemical analysis

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ABSTRACT

Introduction: Examination of viscera by pathologist or chemical examiner is a must in cases where the cause of death is not confirmed/ could not be ascertained during the autopsy. Viscera is handed over to police to be taken to respective laboratories for histopathological examination or chemical analysis or for both. This leads to delay in giving the final opinion regarding the cause of death.

Aim of the Study: To study the delay in giving the final opinion of a particular case from the day of postmortem examination.

Materials and Methods: Study included autopsy cases done in the year 2015 and 2018. The data was collected from the PMR, histopathological and toxicological examination reports and from the final opinion. Delay/ time taken at different levels was studied and the average delay at each level was calculated.

Results: Average delay for final opinion was found to be 561 and 378 days for the year 2015 and 2018, respectively. In one case this time taken was more than 7 years. About 63% of the cases studied are still awaiting final disposal.

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1. Introduction

Death is inevitable. The manner of death will either be natural or unnatural.¹ Inquiry or investigation into the cause of death is called inquest. In India, two type of inquest are followed, police inquest u/s (174 CrPC) or magistrate inquest u/s (176CrPC),^{2,3} The manner, mode and cause of death are determined at autopsy.⁴ Postmortem examination report (PMR) is an important medicolegal document which is required by courts for administration of justice and legal issues, by insurance agencies to settle claims, and by family members of the deceased to know the cause of death, etc.⁵⁻⁷ As per services under Right to Service Act, copies of medicolegal report should be given within two days and copies of PMR within three days.⁸ Once the investigation is

complete, copies of complete medicolegal report should be provided within seven days.⁹ PMR is issued mostly on the day of postmortem examination, however, in cases where viscera are sent for histopathological examination (HPE) or toxicological/chemical examination (CE) or both, final opinion is given after receipt of the reports.^{10,11}

Due to infrastructural and man-power problems, combined with the ever-increasing work load, the investigative agencies and the labs take their own time in processing the cases. Only when both the reports are received by our departments, the final opinion regarding cause of death can be given. Delay in either of these reports results in finalized the cause of death.

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2. Materials and Methods

The present study was aimed at determining the delay in arriving at the final opinion from the day of postmortem examination. Further, analysis was also done to find out the delay by various stake holders i.e., the investigating agency, the labs, and also delay on part of our department, too. The data, viz, case details, commencement of autopsy and dispersal of viscera, histopathological and toxicological examination reports (date of receipt of viscera, date of reporting and date of dispatch of reports) and from the final opinion (date of request for final opinion, date of final opinion), etc., was collected retrospectively, from the records of the post-mortem examinations conducted in the year 2015 and 2018. Usually, it takes around two years to give the final opinion regarding cause of death. This study was conducted on the postmortem examination conducted in the pre COVID period to rule out the delay related to COVID restrictions. The time taken at different levels was studied and the average delay at each level was calculated using SPSS version 24.

3. Observations and Results

A total 900 and 1172 autopsies were conducted in the year 2015 and 2018, respectively. Of these, viscera were sent for further examination in 220 and 435 cases, respectively. Average delay from the day of death to postmortem examination in unknown cases was 10 and 6.2 days for the year 2015 and 2018 respectively, but it was less than 2 days in known cases for both the years. On data analysis, it was found that the final cause of death was opined in only about 37 percent cases. The rest of the cases are still pending. (Tables 1, 2, 3, 4 and 5)

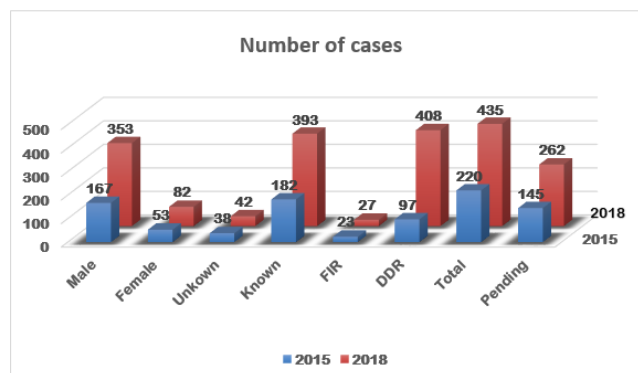


Figure 1: Number of cases

The Kruskal-Wallis test was applied on independent-samples on the data of delay in forwarding and depositing viscera for HPE, which retained the null hypothesis i.e., the delay in forwarding and depositing viscera for HPE across categories of Police Stations.¹² The Kruskal-Wallis test was applied on independent-samples on the data of delay in

Table 1: Showing delay at various level in daily diary report (DDR) cases

| | Year | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 |
|----------------|---------------|--------|--------|--------|--------|--------|---------|---------|--------|--------|---------|---------|---------|--------|--------|
| | Total Cases | 171 | 369 | 26 | 171 | 36 | 161 | 38 | 255 | 153 | 255 | 159 | 331 | 63 | 85 |
| | Pending cases | 26 | 39 | 26 | 171 | 36 | 161 | 38 | 255 | 153 | 255 | 159 | 331 | 63 | 85 |
| Mean | 25.97 | 30.13 | 109.00 | 79.08 | 15.29 | 17.86 | 280.92 | 176.04 | 11.43 | 10.28 | 612.45 | 376.45 | 612.45 | 11.43 | 10.28 |
| Median | 9.00 | 8.00 | 94.50 | 72.00 | 5.00 | 4.00 | 240.50 | 92.00 | 5.00 | 3.00 | 358.00 | 214.00 | 358.00 | 5.00 | 3.00 |
| Std. Deviation | 51.801 | 86.895 | 65.09 | 45.057 | 30.197 | 50.603 | 203.575 | 187.825 | 25.365 | 20.031 | 602.806 | 329.642 | 602.806 | 25.365 | 20.031 |
| Minimum | 0 | 0 | 15 | 3 | 0 | 0 | 31 | 20 | 0 | 0 | 59 | 44 | 59 | 0 | 0 |
| Maximum | 372 | 1036 | 344 | 391 | 402 | 402 | 799 | 781 | 173 | 111 | 2558 | 1432 | 2558 | 173 | 111 |
| Percentiles | 25 | 4.00 | 2.50 | 51.50 | 1.00 | 1.00 | 67.50 | 58.00 | 1.00 | 1.00 | 168.00 | 131.75 | 168.00 | 1.00 | 1.00 |
| 50 | 9.00 | 8.00 | 94.50 | 72.00 | 5.00 | 4.00 | 240.50 | 92.00 | 5.00 | 3.00 | 358.00 | 214.00 | 358.00 | 5.00 | 3.00 |
| 75 | 22.00 | 25.00 | 138.25 | 97.00 | 11.50 | 11.50 | 466.00 | 189.00 | 9.00 | 9.00 | 772.50 | 567.50 | 772.50 | 9.00 | 9.00 |

Table 2: Showing delay at various level in first information report (FIR) cases

| | Delay in depositing viscera for HPE | | Delay in depositing viscera CE | | Delay in Reporting HPE | | Delay in Reporting CE | | Delay in Forwarding HPE report | | Delay in Giving final opinion | | Total time taken from day of PME to give final opinion | |
|---------------|-------------------------------------|--------|--------------------------------|--------|------------------------|-------|-----------------------|--------|--------------------------------|--------|-------------------------------|--------|--|---------|
| Year | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 |
| Total Cases | 18 | 25 | 7 | 10 | 18 | 25 | 6 | 9 | 14 | 17 | 9 | 13 | 10 | 17 |
| Pending cases | 5 | 2 | 16 | 17 | 5 | 2 | 17 | 18 | 9 | 10 | 14 | 14 | 13 | 10 |
| Mean | 155.94 | 40.40 | 20.71 | 59.80 | 120.50 | 84.32 | 4.64 | 25.53 | 123.00 | 311.11 | 9.44 | 11.85 | 228.70 | 393.06 |
| Median | 12.50 | 15.00 | 15.00 | 39.00 | 117.0 | 79.00 | 3.50 | 10.00 | 87.00 | 205.00 | 4.00 | 4.00 | 198.50 | 230.00 |
| Std. | 592.330 | 74.848 | 16.710 | 65.983 | 62.77 | 39.77 | 5.168 | 30.311 | 94.06 | 278.69 | 14.80 | 17.832 | 99.511 | 349.869 |
| Deviation | | | | | | | | | | | | | | |
| Minimum | 1 | 0 | 1 | 6 | 19 | 13 | 0 | 0 | 61 | 98 | 0 | 1 | 113 | 74 |
| Maximum | 2528 | 364 | 43 | 213 | 233 | 179 | 17 | 85 | 306 | 918 | 44 | 52 | 378 | 1240 |
| Percentiles25 | 3.00 | 3.50 | 6.00 | 9.50 | 75.00 | 57.50 | 1.00 | 1.00 | 61.75 | 101.50 | 0.50 | 2.00 | 138.50 | 172.50 |
| 50 | 12.50 | 15.00 | 15.00 | 39.00 | 117.00 | 79.00 | 3.50 | 10.00 | 87.00 | 205.00 | 4.00 | 4.00 | 198.50 | 230.00 |
| 75 | 25.75 | 47.50 | 38.00 | 90.75 | 154.50 | 97.00 | 7.50 | 56.00 | 177.75 | 467.00 | 14.50 | 11.50 | 327.00 | 556.00 |

Table 3: Showing delay at various level in cases belonging to Chandigarh policejurisdiction

| | Delay in depositing viscera for HPE | | Delay in depositing viscera CE | | Delay in Reporting HPE | | Delay in Reporting CE | | Delay in Forwarding HPE report | | Delay in Giving final opinion | | Total time taken from day of PME to give final opinion | |
|---------------|-------------------------------------|--------|--------------------------------|--------|------------------------|--------|-----------------------|--------|--------------------------------|--------|-------------------------------|--------|--|---------|
| Year | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 |
| Total Cases | 74 | 123 | 29 | 56 | 74 | 122 | 28 | 55 | 69 | 86 | 34 | 55 | 35 | 88 |
| Pending cases | 13 | 8 | 58 | 75 | 13 | 9 | 59 | 76 | 18 | 45 | 53 | 76 | 52 | 43 |
| Mean | 23.50 | 19.98 | 42.90 | 30.77 | 110.34 | 78.19 | 223.14 | 111.75 | 9.29 | 19.98 | 8.41 | 7.73 | 722.03 | 398.97 |
| Median | 10.50 | 9.00 | 14.00 | 18.50 | 89.50 | 72.00 | 187.00 | 83.00 | 3.00 | 6.00 | 5.00 | 4.00 | 386.00 | 303.50 |
| Std. | 47.447 | 35.693 | 81.621 | 36.863 | 65.09 | 36.282 | 163.501 | 96.718 | 26.824 | 34.105 | 17.277 | 13.204 | 688.743 | 314.490 |
| Deviation | | | | | | | | | | | | | | |
| Minimum | 0 | 0 | 4 | 1 | 21 | 12 | 33 | 20 | 0 | 0 | 0 | 0 | 87 | 56 |
| Maximum | 360 | 221 | 355 | 213 | 313 | 201 | 534 | 523 | 196 | 200 | 101 | 68 | 2558 | 1432 |
| Percentiles25 | 3.00 | 3.00 | 8.00 | 9.50 | 65.00 | 53.75 | 66.50 | 54.00 | 1.00 | 1.00 | 1.75 | 1.00 | 248.00 | 150.75 |
| 50 | 10.50 | 9.00 | 14.00 | 18.50 | 89.5 | 72.00 | 187.00 | 83.00 | 3.00 | 6.00 | 5.00 | 4.00 | 386.00 | 303.50 |
| 75 | 24.00 | 20.00 | 32.50 | 38.75 | 140.5 | 98.00 | 305.75 | 127.00 | 8.00 | 23.50 | 8.00 | 7.00 | 1239.00 | 555.50 |

Table 4: Showing delay at various level in Cases belonging to Haryana police jurisdiction

| | Delay in depositing viscera for HPE | | Delay in depositing viscera CE | | Delay in Reporting HPE | | Delay in Reporting HPE | | Delay in Forwarding HPE report | | Delay in reporting CE | | Delay in Giving final opinion | | Total time taken from day of PME to give final opinion | |
|---------------|-------------------------------------|---------|--------------------------------|---------|------------------------|--------|------------------------|--------|--------------------------------|---------|-----------------------|--------|-------------------------------|--------|--|---------|
| Year | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 |
| Total Cases | 45 | 112 | 11 | 17 | 45 | 108 | 40 | 70 | 40 | 70 | 9 | 17 | 20 | 16 | 22 | 44 |
| Pending cases | 9 | 18 | 43 | 113 | 9 | 22 | 14 | 60 | 45 | 113 | 34 | 114 | 34 | 114 | 32 | 86 |
| Mean | 34.38 | 62.20 | 83.64 | 118.24 | 119.98 | 87.03 | 24.93 | 12.86 | 307.89 | 393.82 | 11.35 | 16.31 | 11.35 | 16.31 | 426.27 | 422.36 |
| Median | 14.00 | 14.00 | 32.00 | 78.00 | 98.00 | 76.50 | 5.00 | 4.50 | 365.00 | 354.00 | 4.50 | 2.00 | 4.50 | 2.00 | 293.50 | 193.50 |
| Std. | 52.678 | 148.372 | 167.095 | 118.427 | 73.853 | 56.240 | 68.699 | 22.826 | 177.580 | 270.143 | 14.110 | 29.953 | 14.110 | 29.953 | 411.221 | 391.163 |
| Deviation | | | | | | | | | | | | | | | | |
| Minimum | 0 | 0 | 3 | 6 | 15 | 11 | 0 | 0 | 54 | 29 | 0 | 0 | 0 | 0 | 115 | 45 |
| Maximum | 258 | 1036 | 580 | 387 | 344 | 391 | 402 | 91 | 479 | 918 | 44 | 87 | 44 | 87 | 1949 | 1138 |
| Percentiles25 | 5.00 | 3.00 | 11.00 | 27.50 | 69.00 | 54.25 | 2.00 | 1.00 | 132.50 | 130.50 | 1.00 | 1.00 | 1.00 | 1.00 | 138.50 | 119.75 |
| 50 | 14.00 | 14.00 | 32.00 | 78.00 | 98.00 | 76.50 | 5.00 | 4.50 | 365.00 | 354.00 | 4.50 | 2.00 | 4.50 | 2.00 | 293.50 | 193.50 |
| 75 | 41.50 | 65.25 | 66.00 | 166.00 | 152.50 | 100.50 | 16.00 | 11.00 | 473.50 | 592.00 | 22.50 | 10.50 | 22.50 | 10.50 | 636.75 | 805.50 |

Table 5: Showing delay at various level in cases belonging to Punjab police jurisdiction

| | Delay in depositing viscera for HPE | | Delay in depositing viscera CE | | Delay in Reporting HPE | | Delay in Reporting HPE | | Delay in Forwarding HPE report | | Delay in reporting CE | | Delay in Giving final opinion | | Total time taken from day of PME to give final opinion | |
|---------------|-------------------------------------|--------|--------------------------------|--------|------------------------|--------|------------------------|--------|--------------------------------|---------|-----------------------|--------|-------------------------------|--------|--|---------|
| Year | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 | 2015 | 2018 |
| Total Cases | 67 | 135 | 7 | 8 | 67 | 135 | 63 | 105 | 6 | 6 | 17 | 16 | 17 | 16 | 17 | 26 |
| Pending cases | 7 | 12 | 67 | 139 | 7 | 12 | 11 | 42 | 68 | 141 | 57 | 131 | 57 | 131 | 57 | 121 |
| Mean | 19.12 | 16.84 | 12.43 | 10.75 | 107.58 | 75.07 | 20.13 | 15.75 | 393.83 | 417.83 | 16.76 | 8.00 | 16.76 | 8.00 | 434.59 | 282.77 |
| Median | 7.00 | 6.00 | 9.00 | 6.50 | 102.00 | 68.00 | 4.00 | 5.00 | 334.50 | 554.50 | 3.00 | 3.00 | 3.00 | 3.00 | 199.00 | 184.50 |
| Std. | 49.651 | 32.842 | 15.946 | 14.704 | 58.884 | 42.008 | 52.655 | 32.292 | 320.694 | 240.913 | 41.255 | 13.525 | 41.255 | 13.525 | 440.968 | 306.411 |
| Deviation | | | | | | | | | | | | | | | | |
| Minimum | 0 | 1 | 1 | 1 | 19 | 3 | 0 | 0 | 62 | 60 | 0 | 0 | 0 | 0 | 113 | 44 |
| Maximum | 372 | 213 | 47 | 45 | 285 | 326 | 313 | 166 | 799 | 600 | 173 | 52 | 173 | 52 | 1598 | 1240 |
| Percentiles25 | 3.00 | 2.00 | 2.00 | 1.00 | 58.00 | 50.00 | 1.00 | 1.00 | 92.00 | 135.75 | 1.00 | 1.25 | 1.00 | 1.25 | 149.50 | 105.00 |
| 50 | 7.00 | 6.00 | 9.00 | 6.50 | 102.00 | 68.00 | 4.00 | 5.00 | 334.50 | 554.50 | 3.00 | 3.00 | 3.00 | 3.00 | 199.00 | 184.50 |
| 75 | 17.00 | 15.00 | 14.00 | 13.75 | 139.00 | 92.00 | 11.00 | 12.00 | 748.00 | 582.75 | 13.50 | 7.75 | 13.50 | 7.75 | 719.00 | 260.00 |

Delay in Depositing and reporting CE, which rejected the null hypothesis i.e., the delay in forwarding and depositing viscera for CE varies across categories of Police Stations. For the distribution of delay in giving final opinion and the distribution of total time taken from date of PME to final opinion Kruskal-Wallis test on independent-samples retained the null hypothesis i.e., delay in giving final opinion and total time taken from date of PME to final opinion is the same across categories of Police Station.

4. Discussion

This study was conducted at GMCH Chandigarh. This institution has jurisdiction to conduct postmortem examination of cases of Union territory (UT) Chandigarh and all the admitted and brought dead cases of other region. Majority of cases were from the Chandigarh, Punjab and Haryana. Out of 2072 medicolegal autopsy conducted, viscera were sent for analysis in 655 cases. Viscera was sent for analysis only in cases where cause of death was not certain after the autopsy, poisoning cases, sudden death, road traffic cases having suspicion of intoxication and in cases of suicidal/homicidal hanging to rule out concomitant intoxication. Viscera is usually handed over to the concerned police official after the autopsy on same day, who then first takes it to the Police store room (Malkhana) and then to the concerned laboratory. After the analysis of viscera, laboratory personnel make a report which is sent to the concerned autopsy surgeon, who then send this report in original to the concerned police official, after taking the photocopy of the same for the departmental record. When police officer receives both the reports, he writes a request to the concerned autopsy surgeon for the final opinion of cause of death. Final opinion is usually given within three days by the doctor on duty. The study calculated the time taken by different stack holders at each step. It could be assumed that practically a minimum time must be required at each step, which cannot be zero.^{11,12} Time taken by police department to deposit the viscera to FSL or Pathology department collected from the department of forensic medicine may depends upon the distance between the labs which varied highly among various FSL. Once at the lab, the time taken by Pathology department to finalizing the report may depends upon the minimum time required for various steps like formalin fixation, grossing, embedding, sectioning, staining and finally reporting.^{13–16} Similarly, time taken by the FSL to finalizing the report may well depend upon the minimum time required for processing of the sample.¹⁷ Overburdening of labs may be another independent factor.

This delay can be divided into two groups, 1st pre-analysis delay and 2nd post analysis delay, both are having different consequences. Pre-analysis delay may lead to the decomposition of viscera. In police custody viscera is usually kept at room temperature so any undue delay

by police can result in decomposition of viscera and subsequently to the negative autopsy. Post analysis delay which includes delay at the level of police and by the autopsy surgeon in forwarding the viscera report and in giving final opinion. It may impact the justice, of course which is also impacted by the pre-analysis delay. In our study 63 percent cases are still waiting for the final disposal, it has been proved in previous studies that if the delay is more than 3 years, viscera analysis is just a formality because tissue gets decomposed.^{18–21} Further studies are required to determine the various cause of delay at each step, and then the strategy to mitigate the same could be planned. Whatever may be the reason, the undue delay in reporting of viscera is such a well-known fact, that receiving a report even after a yearlong time also is considered as normal.

5. Conclusion

Death of dear ones is a great loss to the family. It is their right to know about the cause of death. Post-mortem report is also essential in insurance claims and other medicolegal issues. The autopsy surgeon, pathologist, chemical examiner and police personnel should try to avoid undue delay in final disposal of the case. Though due to lack of manpower, an enormous work load in police departments and hospitals, the very process gets delayed. Delay can be reduced by getting the histopathological examination work done by forensic expert, by setting up new histopathology laboratory in the forensic medicine department and by sensitize the concerned staff towards the nature of work and the consequences of delay. The establishing of new Forensic Science Laboratory in this region may reduce the burden and lead to timely disposal of such cases.

6. Limitations of Study

Issues while collecting the information from the old records. Few cases were excluded because of the nonavailability of important dates (misprint, illegible handwriting).

7. Ethical Approval

The ethical approval was taken from Institutional ethics and research Committee.

8. Source of Funding

None.

9. Conflict of Interest


There is no conflict of interests.

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