

## **Post-mortem ocular changes: a study on autopsy cases in Bharatpur Hospital**

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### **Abstract**

Post mortem eye changes are important evidences to assess post mortem interval. Present study was conducted at Bharatpur Hospital, Bharatpur over 150 autopsy cases during year 1999-2000. In 140 autopsy cases usual post mortem eye findings were observed, e.g. dull cornea, dilated and fixed pupil and soft eye. Fundus findings like cattle-truck appearance could be observed in 10 cases.

**Key Words:** Death, Autopsy, Ocular, Post Mortem Interval.

Post-mortem eye changes have been discussed extensively in almost every forensic literature. These changes are helpful in assessing the brain death, early signs of death and post-mortem interval (PMI)<sup>7</sup>. However, ocular signs are not conclusive evidence of death; rather they are only supportive evidences.

A detailed knowledge of post-mortem eye changes are necessary to provide eye banking services to the community. Present Study was conducted to observe post-mortem eye changes.

### **Materials and methods**

Present study was conducted over 150 dead bodies brought to Bharatpur Hospital, Bharatpur, Chitwan (dist.) for post-mortem examination. Cause of death was noted by forensic expert. Ocular examination included external examination with torchlight, pupillary reaction, fundus examination with direct ophthalmoscope and digital tonometry. Ocular examination was performed by the ophthalmologist in the presence of the forensic expert. Ocular findings were noted and data was analyzed.

### **Observation and results**

The study was conducted over 150 dead bodies brought to Bharatpur Hospital, for post-mortem examination during the year 1999-2000 of which 92 were males and 58 females. Out of total 150 bodies, 29 died due to poisoning, 28 due to hanging, 48 due to RTA and other accidents, 8 due to drowning 6 due

to gunshot, 3 due to fatal injuries, 2 due to electrocution and 1 each died due to elephant attack, burn and bomb explosion.

In 140 bodies, the corneas were dull, lusterless and opaque with wrinkles on the surface. Pupils were dilated and fixed in all bodies. Ophthalmoscopic examination could be performed in 10 bodies only due to clear cornea. All of which revealed typical cattle-truck appearances. All eyes were soft to the extent of indentation on palpation. Majority of them were sunken into orbital fossa. Ocular findings were more or less the same in all eyes irrespective of cause of death.

### **Discussion**

After somatic death certain tissues, cells and enzymes in the body continues to live individually or collectively for a period of time depending to some extent on the cause of death, condition of the cells or tissues before death and their oxygen requirement<sup>2</sup>. Since the cornea of eye remains in direct contact to environment and continues to get oxygen for its metabolism, it remains viable for longer period until it is desiccated. This is the basic principle of eye banking and keratoplasty which is the simplest and most effective organ transplantation.

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All post-mortem ocular changes are classified as early post-mortem changes. Loss of corneal reflex, clouding of cornea, "tache noir" (wrinkled and brown corneal surface exposed between eyelids) are some of the post-mortem corneal changes<sup>6</sup>. Pupils are dilated and fixed initially but may be constricted with the onset of rigor mortis. Pupils react to atropine for about an hour after death<sup>4</sup>. This simple test could not be performed in present study because all the bodies were brought for post-mortem examination minimum after 4 hours of death. Typical findings in retina are fragmentation of blood column in retinal vessels (Cattle-truck appearance).

Retinal findings are inconclusive in present study which is in contrary to the work of Amberg R, Pollak S who reported that different patterns of fundoscopic findings seem to correspond to different types of injuries such as craniocerebral trauma, traumatic asphyxia and compression sickness and may allow some insight into the respective pathogenic mechanism<sup>1</sup>.

Also, Dolezalova Y reported that examination of ocular fundus after death could contribute to the assessment of time of death<sup>3</sup>. No conclusive evidence can be obtained about any correlation of fundus findings at the time of death.

Other Ocular changes include flaccidity of eye ball and linear rise in potassium in the vitreous<sup>5</sup>. Further study is required on this topic as it is a useful indicator of post-mortem interval.

## Conclusion

In conclusion, present study gives a concise description of various post-mortem eye changes. These changes are important for developing eye banking services. These also help in the assessment of post-mortem interval. Further studies with much larger number of autopsy cases needs to be done.

## Reference

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