

FORENSIC MEDICINE

Sr. No.	Topics
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TOXICOLOGY

1.	Assessment of use of saliva as a non-invasive sample for toxicological testing using high performance liquid chromatography.
2.	Development of a lateral flow assay method for detection of organophosphate (or any other poison) in body fluids (blood/urine/saliva).
3.	Comparative efficacy of suitable methods* / ideal body fluids (blood, urine, vitreous humour and Cerebrospinal fluid) for drug level estimation in autopsy samples (*Thin layer chromatography / liquid chromatography coupled with Mass spectrometry / High performance liquid chromatography)[<i>to be considered where institutional facilities exists</i>].
4.	Prevalence of drug of abuse in medicolegal autopsy cases.
5.	Comparison of liver histopathology findings in deaths due to rodenticide poisoning (cases) vs. non-poisoning deaths (controls) - A case control study.

Injury

6	Utility of Trauma Scores (using Abbreviated Injury Scale or Glasgow coma scale) vis-a-vis definition of Grievous Hurt to assess the severity of injury.
7	Analysis of pattern of injuries in female victims of alleged sexual assault.
8	Comprehensive analysis of rib fracture patterns in blunt trauma chest/abdomen applying forensic biomechanics.
9	Analysis of pattern of injuries and correlating with weapon of offense in Homicidal Death Investigation.

10	Describing autopsy findings of the neck in different types of mechanical compression of the neck.
11	Estimation of biomarkers of diffuse axonal injuries and their association with the survivability and prognosis of the patients.
12	Comparative analysis of Computed tomography (CT) scan and autopsy results in cases of head injuries as well as the investigation of Computed tomography (CT) Scan Predictors for Head Injury Outcome in the Medical College Hospitals in India.
13	A comprehensive analysis of mechanism of injury of fractures of cranial vault and base of skull in critically-injured head injury cases – An ambispective study.
Identification / age estimation:	
14	Estimation of stature from the measurements of mastoid prominence / mastoid triangle / mesiodistal crown dimension / interpremolar width measurements of permanent molars: A Computed tomography (CT) based craniometric study.
15	Study of appearance and fusion of ossification centres of bones in Indian population for medicolegal age estimation.
16	Estimation of vaginal prostate-specific antigen-30 (PSA-30) levels in survivors of sexual assault to establish the identity of the assailant.
17	To establish usefulness of obturator foramen as a tool for sex assessment in specific population groups (ex. tribal population/ different geographical locations in India).
18	Utilization of various Artificial Intelligence software in Forensic Anthropology for determination of sex and age from Computed tomography (CT) Based studies.
19	Utility of salivary glycoproteins in age estimation.
20	Estimating age of an individual using facial dimensions.

21	Can we predict the sex of an individual based on presence of transferrin in Saliva?
22	Can we predict the sex of an individual by taking metric measurements of the mandible bone at autopsy?
23	Can we predict the sex of an individual from fragmentary pelvic bones?
24	Analysis of the specificity of Touch microbiome in adult fingerprints.
Forensic pathology:	
25	Estimation of age of brain contusion by macroscopic and microscopic examination.
26	Study of histopathological changes in endocrine glands (suprarenal/thyroid/pituitary glands) in alleged suicidal deaths.
27	Comparison of histopathology findings of lungs between various types of asphyxial deaths.
28	What is the accuracy and reliability of enzyme histochemical method in ante mortem injuries?
29	Unravelling the causes and patterns of unnatural deaths amongst rural Indian men based on verbal autopsy / reconstruction of events and advancing DNA forensic techniques for improved determination: An Interdisciplinary Approach.
30	Can we predict myocardial infarction by using cardiac markers in post-mortem blood samples of sudden cardiac deaths?
31	Assessing viability of DNA extraction from semen by polymerase chain reaction (PCR), placed at different environmental conditions for different duration.
Epidemiology:	
32	A cross-sectional study on correlation of vehicle to non-fatal injuries in road traffic accidents reporting to hospital.
33	Study of pattern of deaths at work place.
34	Study of suicidal deaths among children and adolescents.

35	Assessing burden of myocarditis/ other cardiac conditions in cases of sudden deaths in young by histopathological examination of heart.
36	Presence of post-mortem tuberculosis lung / polymerase chain reaction (PCR)-based testing of pleural samples to estimate tuberculosis burden in medicolegal autopsies.
Autopsy-related:	
37	Age estimation of dead foetus from anthropology, radiology of femur and humerus bones and from morphoscopic features of aborted foetus – A hospital study.
38	Efficacy of virtopsy vis-à-vis traditional autopsy for medico-legal post mortem examination.
39	Prevalence of infections amongst autopsies conducted at hospital.
40	Autopsy study of sudden natural death in children / young adults / women / elderly.
41	Establishing the usefulness of X-ray before autopsy in diagnosis of fractures of extremities/cardiac tamponade /effusion/lung consolidation, as a low-cost aid to conventional autopsy.
42	Predictive accuracy of immune-histochemical markers in the aging of abrasion - An autopsy based study.
Time-since death estimation:	
43	Estimating the post-mortem interval (time since death) from electrolyte levels of vitreous humor and plasma - Does the cold chamber temperature play a role?
44	Estimation of time since death using cellular autolytic changes using specific markers.
45	Estimation of time since death by biochemical changes.
46	Estimation of time since death from insect infestation of cadaver in simulated cases of entomology.

47	Study of thyroid hormone /insulin/ glucocorticoid hormone levels to estimate time since death.
48	Estimation of time since death by assessing the histo-pathological changes in the muscle tissues.
Forensic psychiatry:	
49	Administration of various psychological tools like Violence risk assessment for children in conflict with the law in India.
50	Profiling the pattern of substance abuse in children in conflict with the law in India.
51	Criminal profiling of children below 12 years in conflict with Law.
52	Identification and Comparison of Alcohol Abuse Patterns between Alcoholic and Occasionally-Alcoholic Groups amongst middle-aged citizens in select cities of South India using Laboratory Tests (Gamma-glutamyl transferase, aspartate aminotransferase, alanine aminotransaminase, and mean corpuscular volume), CAGE (<i>Cutting Down, annoyance by criticism, guilty feeling and eye-openers</i>) and AUDIT (<i>Alcohol Use Disorders Identification Test</i>) Questionnaires.
53	Psychological autopsy in cases of suicidee / homicide perpetrators using specific questionnaire to detect depression, aggressiveness & mental disorders.
54	A study of psychological, socio-demographic and substance abuse profiles of female offenders in India.
Medical Jurisprudence:	
55	A 5-year Critical Analysis of Medical Negligence Cases in India: Investigating Factors Influencing Legal Outcomes, Patient Welfare, and Implications for Healthcare Systems using multidisciplinary approach – A retrospective / record-based study.
56	A study of medical negligence cases decided by the state consumer disputes redressal commissions.

57	A study of post burn septicaemia at a tertiary care hospital and its medicolegal evaluation.
Miscellaneous:	
58	Study of biomarkers like 5-Hydroxy indole acetic acid (5-HIAA) / Brain derived neurogenic factors (BDNF) levels in suicidal deaths.
59	Positive predictive value of biochemical markers in cases of deaths by suicide.
60	Quantitative estimation of Strontium metal as marker for diagnosing death by fresh water drowning.