

Forensic Medicine & Toxicology

Sunday 30/7/2023 (seminar)

1. Charcoal adsorbs substances of molecular weights between 100 to 1000 daltons (not effective for ethanol poisoning [46 daltons])
2. Metronidazole shouldn't be taken with alcohol
3. Kerosene poisoning > the risk of aspiration is higher than the risk of systemic absorption > emesis and gastric lavage are contraindicated > give water if conscious (milk and oil emulsify kerosene and increase absorption) > if aspirated; can lead to pneumonia and other serious lung complications (loss of surfactant > collapse)
4. Coma cocktail = oxygen + intravenous dextrose (hypoglycemia is more serious than hyperglycemia) + thiamine (given before dextrose if alcohol poisoning is suspected) + naloxone (will not have any adverse effects if an opioid is not present in the patient's system)
5. Corrosive acids & alkali > a. Avoid gastric emptying (emesis & lavage) / b. Make them drink water or milk (milk is better (emulsification)) to dilute the substance / c. Surgery if any damages are detected
6. Organophosphate poisoning > atropine is given only after stabilization (tachycardia/ high risk of MI)
7. Bile acid sequestrants (e.g: cholestyramine) can be used alongside laxatives to improve elimination and decrease absorption through the GIT (cut the enterohepatic cycle)

Tuesday 1/8/2023 (morgue)

1. Conjunctival petechiae > sensitive but not specific to asphyxia
2. 4 things we look for during our observation of the cadaver preceding autopsy: a. Pathological signs of chronic diseases / b. Injuries (lacerations/ bruises/ signs of self defense) / c. Marks of previous surgeries / d. Marks that indicate any kind of life-saving interventions practiced on the patient before arriving to the hospital

3. In trauma induced asphyxia (i.e: heavy object falling on the chest) > a cutaneous petechial rash is present above the level of pressure

4. IV marks in drug abusers compared to typical IV marks: multiple (yet abusers tend to take their shots in the same spot) / overlying fibrosis + if sniffing > nasal septal necrosis

5. Subarachnoid hemorrhage either : pathological > we look for berry aneurysms / traumatic (i.e: RTA) > we look for skull fractures

6. ALL unnatural deaths > full autopsy not partial autopsy

7. Order of incision and investigation in autopsy: thoracoabdominal (midline) > brain > neck

8. Spinal cord autopsy > preferably removed posteriorly

9. We do an autopsy for any patient who dies outside the hospital or after arriving to the hospital if passed away before the results of the ordered investigations were out

10. If the patient died on the surgery table > autopsy (almost always the surgeon himself reports the death to disclaim responsibility) unless it's a life-saving surgery (one exception is the life-saving surgeries that are the outcome of incidents with a judicial nature (i.e: RTA))

11. 1 week after the surgery : if stayed in the hospital and died there > no autopsy unless the family asks for one / if died outside the hospital > autopsy

12. If a patient with a known disease died in his home (naturally) and the dr who's fully aware of his condition witnessed this (not any random dr) the death report could be written without the need of an autopsy but like what are the odds

13. Who writes the primary death report ? The dr who has the first contact with the dead (usually the ER dr)

Tuesday 1/8/2023 (seminar)

1. Substance abuse : a. Not used for its pharmacological benefits / b. No cultural acceptance

2. What do we fear when it comes to substance abuse ? a. Dependence / b. Infection (IV) / c. Nasal septal necrosis (sniffing) / d. Suffocation (due to the substance's anesthetic effect) / e. Criminal acts / f. Decreased productivity / g. Poor social interactions / h. The purity of the substance (if mixed with unsafe substances> endangers one's life even more)

3. قانون المخدرات والمؤثرات العقلية: جداول مصنفة بناءً على ال severity of the substance و ليس اعتمادًا على طبيعة المادة stimulant / depressant

4. يُسمح للأطباء امتلاك ال opioids - narcotic analgesics في عياداتهم و لكن يتوجب عليهم أخذ تصريح لحيازته و أن يلي ذلك متابعة للكميات الممنوحة للمرضى في سجلات دقيقة و حفظ هذه الأدوية في أماكن آمنة يصعب الوصول إليها من قبل المرضى

5. عند وصف ال opioids للمرضى من قبل الطبيب يتم طلبها باستخدام وصفة معتمدة خاصة بهذه الفئة من الأدوية تكون صالحة للاستخدام لمدة ٣ أيام و لا يمكن للمريض أخذ احتياجاته من هذا الدواء إلا من صيدلية واحدة فقط حيث يقوم الصيدلاني بأخذ الوصفة من المريض (تكون هذه الإجراءات الاحترازية أكثر أهمية عندما يكون الشخص من ذوي الأمراض المزمنة التي تتطلب أخذ هذه الأدوية بشكل دوري)

6. إذا جاء المدمن لطلب الرعاية الصحية اللازمة للتعافي طوعًا سقط عنه الحق العام و إذا أفشى أحد الأطباء سره يحق للمريض ملاحقة هذا الطبيب قضائيًا

7. The only 2 medical indications for amphetamines are: narcolepsy & ADHD

8. Amphetamine poisoning (home measures) = water + lemon (acidification of the urine) / no antidote

9. Morphine overdose > naloxone > risk of withdrawal reaction > to avoid that we give a longer acting opioid for few days

10. Cannabis > easily captivated but illegal

11. Cannabis > the active substance is in the leaves & flower petals not the seeds (قنبس < طعام)
(العصافير)

12. Smoking cannabis ? Meh nothing serious, oral or IV ? Might lead to overdose despite the low possibility of toxicity & fatality associated with cannabis

13. Cannabis > psychological dependence (no physical dependence)

14. Carbon monoxide is lighter than air

15. Cyanosis shows when 1/3 of Hb is deoxygenated (5 g/dL)

16. In CO poisoning > red flushed skin (due to high levels of carboxyhemoglobin in the blood)

17. Livor mortis in a patient whose death is attributed to CO poisoning > cherry red

18. Most common cause of death in the case of CO poisoning is MI

19. To assess the amount of carboxyhemoglobin in blood we can either take a blood sample from an artery or a vein but we prefer to take a venous sample as there's no difference and it's much easier to obtain

20. Never expose a blood sample for a patient with CO poisoning to air as it will alter the sample (falsely lessen the amount of carboxyhemoglobin)

21. CO poisoning leads to acidosis ... is it better to keep the patient's blood slightly acidic or induce alkalosis ? Acidosis is better (CO poisoning > left shift in the oxygen-hemoglobin dissociation curve / acidosis > right shift in the curve)

22. Normally we have some CO in the blood > catabolism of Hb

23. Normally we have some cyanide in the blood > metabolism of B12 (cyanocobalamin)

24. There's a good percentage of people who are genetically unable to smell cyanide > can't be used as a tool for diagnosis

Thursday 3/8/2023 (seminar)

1. Vegetative state > the patient still has a functioning brainstem (in order to consider the patient brain dead we need to have a nonfunctioning brainstem)

2. Gunshot to the head : a. Manner: homicide or suicide / cause + mechanism : brain injury, brain laceration, or skull fracture due to gunshot (never dare to say bleeding) / mode : coma

3. Most common cause of death in electrocution is Vfib

4. Stab wounds don't gape if postmortem due to loss of skin elasticity

5. Tache noire is not pathognomonic for any cause of death (no suspicion for a certain cause of death)

6. Core temperature starts falling 3 hrs after the onset of death (bcoz heat loss starts from the surface)

7. Factors that affect the rate at which core temperature falls : a. Age / b. Sex (males faster than females) / c. Weight / d. Clothing / e. Water or air (water faster) / f. Body position / g. Cause of death

8. Pale livor mortis : severe anemia / hemorrhage/ extremities of age

9. Emotional death > instead of the typical flaccidity the individual deals with cadaveric spasm immediately at the onset of death

10. Rigor mortis starts when the ATP amount decreases to 85% of its normal level

11. Running / electrocution / drowning > fasten the onset of rigor mortis as they deplete ATP

12. Decomposition > starts immediately after death > starts showing after 48 hours > appears first as a greenish discoloration in the right iliac fossa

13. In cases of death attributed to stab wounds, decomposition happens in a much faster rate

14. Faster putrefaction : obese / extremities of age / higher temperature & humidity / stab wound
/// slower putrefaction: bleeding cases

15. Faster mummification: thin / female / newborn / took antibiotics before death / cyanide poisoning

Sunday 6/8/2023 (morgue)

1. مدة التعطيل :

** Dr Farah** - 10/8/2023 (seminar)

Days
upto
~~week~~
week

①
خبرته
كسوة
مروج تهليلية

6-8 wks ← كدرج، الاطراف العلوية ②

12-16 wk ← اقلية " " " ③

4-8 wks. ← كدر الرقوة ④

2 wks. ← كدر العظام السفلية ⑤

2-4 wks. ← Flat bones
liner# ⑥

كدر الورك ← الكروف ⑦

1° → week.

** Dr Lamia ** - 6/8/2023 (morgue)

- A. Upper limb fracture: 6-8 weeks
- B. Lower limb fracture: 12-14 weeks
- C. Small bone fracture: 2 weeks
- D. Facial fractures: 2 weeks
- E. Flat bones : linear fracture > 2-4 weeks / comminuted or displaced (with or without intracranial hemorrhage) > 2-3 months
- F. Abrasions & bruises: 1-3 days (but varies depending on the area affected and the surface area involved/ if large might take 1-2 weeks)
- G. Friction abrasion: >3 days (around 1-2 weeks)
- H. Cutaneous laceration & incision: 5 days max
- I. Clavicle: 4-8 weeks

** note: ligaments are dealt with like bone as their tears show no improvement without surgical intervention **

2. العاهة : خسران عضو أو جزء منه أو وظيفة عضو أو جزء منها أو تشويه يصل إلى درجة عاهة أو استبدال جزء من الجسم بمادة من غير جنسه

3. تقرير لاحق: تقرير يُكتب قبل التقرير القطعي في حال احتياج المريض إلى تقرير قبل استقرار حالته و صدور التقرير القطعي (متى يُكتب ؟ عند وجود إصابات طويلة الأمد / عند وجود احتمالية ظهور مضاعفات ثانوية للإصابة أثناء فترة التعافي)

Examples:

Skull fracture (risk of seizure with the 2-3 months of healing)

Children (growth plate fracture / affects proper growth)

4. حالة قضائية : وفايات (أي قضية بحاجة بيئة طبية / احتمال وجود شبهة جنائية) / الأحياء (ضمان الحقوق و إيقاع الجزاء بمستحقه)

5. Apparent death : hypothermia / drowning / drug overdose / coma / electrocution

6. Reflexes are maintained in apparent death

7. Immediate signs of death: pallor / flaccidity / eye sinking / decreased intraocular pressure/ cessation of breathing & circulation

8. Livor Mortis : starts immediately after death / shows after 30 mins / peaks at 8 hrs / fixed at 12 hrs

9. Algor mortis : starts after 2-3 hrs / an average fall in core temperature 1 C / 30 mins (but varies with the external temperature significantly)

10. Rigor mortis: starts after 2 hrs / peaks at 12 hrs / fixed for another 12 hrs / declines during the following 12 hrs until completely disappears (total of 38 hrs)



Sunday 6/8/2023 (seminar)

1. Cases where we can't determine the distance of shooting (in other words when there's no signs at the entry wound except for an abrasion collar): underwater shooting / magic bullet / when the bullet hits sth before hitting the body (could be anything including clothes)
2. Entry wound = exit wound (morphologically) > if the victim was supported by a hard solid surface at the exit point (i.e: leaning against the wall)

Tuesday 8/8/2023 (seminar)

1. Febrile = lower threshold for acetaminophen toxicity (increased metabolic rate)

2. Why do we start monitoring blood levels of acetaminophen after 4 hours of the ingestion ? The pills accumulate in the stomach forming a concrete mass that needs 4 full hours to be disintegrated and absorbed (this is when charcoal comes in handy)
3. In chronic acetaminophen toxicity there's sth we call the gray zone (acetaminophen blood level between 11 and 25 mcg/ml) > here the next step depends on the clinical judgment of the physician
4. Panadol joint : a. Increased dose 650mg / b. Sustained release > the effect lasts for 8 hrs and 1 pill/time is considered enough
5. Both methanol and ethylene glycol are colorless & sweet (ethylene glycol > methanol in terms of sweetness)
6. Methanol & ethylene glycol don't get sold in the pure form (100% concentration) instead they get sold with a concentration of 20-30%
7. Methanol / ethylene glycol > antifreeze
8. In case of methanol / ethylene glycol toxicity we pay extra attention to the heart & kidneys
9. Ethanol > toxic / metabolites> non-toxic
10. Methanol + ethylene glycol > non-toxic / metabolites > toxic
11. When we block the ADH pathway in methanol / ethylene glycol toxicity > we're left with the unmetabolized form of one of these two compounds (which are non-toxic in nature) > they leave the body unchanged through the kidneys in a much slower manner (~ 5 days)

12. In alcoholics there's delayed presentation of methanol / ethylene glycol toxicity (slower metabolism)
13. (Affinity to ADH) Ethanol = 10*methanol / ethanol = 100*ethylene glycol
14. 100-150 mg/dl (blood level) of ethanol in the case of methanol/ ethylene glycol toxicity
> we ensure that there won't be any biotransformation to the toxic metabolites
15. 1 unit of alcohol = 10 gm of alcohol / 1 unit of alcohol in a 70 kg person > 25 mg/dl BAC (variable among different weights)
16. 1 unit of alcohol = 300 ml of beer / glass of wine / 40 ml spirits
17. Alcohol toxicity happens when BAC is ≥ 400 & < 500 mg/dl
18. Drunkenness happens when BAC = 100-150 mg/dl
19. Death occurs when BAC exceeds 500 mg/dl
20. Two persons present to the ER with alcohol intoxication (same BAC) > the one with the more rapid recovery is more likely to be a regular alcohol drinker
21. Alcohol elimination rate ~ 20 mg/hr
22. On an empty stomach, BAC peaks about one hour after consumption it then declines in a more or less linear manner for the next four hours

23. Binge drinking is having 5 or more drinks in a row by males or 4 or more drinks in a row by females (females : less water / more fat > for the same weight & dose = 25% increase in BAC)
24. Binge drinking on empty stomach is preferred as food delays drunkenness (alcohol absorption > 20% stomach / 80% small intestine)
25. Alcohol reduces blood sugar levels yet doesn't result in hypoglycemia (chronic alcohol drinkers = higher susceptibility for hypoglycemia)
26. Gastric lavage might be helpful within 8 hrs of alcohol consumption for people who drink alcohol with food / as for people who do it on empty stomach there won't be any benefit (as there won't be any alcohol in the stomach within an hour of consumption)
27. The consumption of 1 bottle of alcohol leads to a BAC of 800 mg/dl > normally fatal but not fatal when : a. The patient is alcoholic (faster metabolism) / b. The patient drinks his alcohol with a fatty meal / c. When the microsomal ethanol oxidizing system is activated (gets activated when BAC is ~ 300 mg/dl on almost daily basis)
28. Increased risk of alcohol intoxication when : a. Alcohol concentration is 20-30% (diluted drinks are riskier than concentrated drinks as the latter induce vomiting) / b. The patient drinks alcohol on an empty stomach / c. When the drink is carbonated (increased surface area for absorption through bubbles formation)
29. Lannate is such a successful killer : colorless / tasteless / odorless / fatal in small doses / rapid action
30. Pesticides' toxicities : 80% carbamate pesticides/ 15% organophosphate pesticides/ 5% others

31. Pinpoint pupils + frothy secretions > most likely the presentation of pesticide poisoning
32. Carbamates > reversible acetylcholinesterase inhibitor / organophosphate > irreversible acetylcholinesterase inhibitor
33. Atropine > muscarinic + central effects / Pralidoxime > nicotinic effect
34. Carbamate > atropine only / organophosphate > atropine + pralidoxime
35. Pralidoxime > breaks the irreversible covalent bond between the organophosphate and the acetylcholinesterase but if aging takes place (the covalent bond becomes shorter and stronger with time passage) it will be useless
36. How to differentiate between carbamate & organophosphate poisoning?
acetylcholinesterase level (if it increases with time this means hydrolysis happened > reversible inhibition > carbamate / if it doesn't increase > irreversible inhibition > organophosphate)
37. Pesticides are heat labile

Wednesday 9/8/2023 (morgue+seminar)

1. Rigor mortis doesn't develop any faster in the case of contact shot
2. The most important characterizing feature of laceration is bridging
3. Flame hemorrhage > when someone dies of bleeding > the heart becomes empty > so pumping leads to hemorrhage over the endocardial surface of the heart

4. الحالة العامة : جيدة (stable / no risk of complications) / متوسطة (risk of complications/ healing) / سيئة (> death) / (unstable)

5. If we see the patient within the first 2 hrs of death > incomplete livor mortis > the area of dependency has some pale spots at places where there's no pressure applied

6. We need to wait for 6 months to write تقرير قطعي for a head trauma patient (we can write تقرير لاحق instead during this time period)

7. Internal petechial hemorrhage in the case of asphyxia spares the abdominal organs

8. Pressure marks in SIDS remain after death

9. Six Penny bruises > five coin-like bruises (in the case of manual smothering when the murderer is wearing gloves)

10. Cricoid cartilage fractures occur only in the case of throttling

11. Incomplete hanging is almost always homicidal until proven otherwise (head weight leads to death in the case of incomplete hanging)

12. Fixed vs loose hanging > loose hanging is characterized by continuity (similar to strangulation in this regard)

13. Highest risk of hyoid bone fractures (strangulation vs hanging vs throttling) ? Throttling

14. إذا حاول أرجع ال hyoid bone لجوا بحالة ال hanging رح ترجع بس لوضعها الأصلي و ما رح نقدر نرجعها لجوا أكثر من هيك لأنه عم نتعامل مع incomplete fracture

15. One reason for the outward breakage of the hyoid bone in the case of hanging is the downward movement of the ligaments under the influence of gravity
16. When hanging takes place postmortem it's more likely for us to see struggle marks
17. In both fresh water & sea water drowning the cause of death is cardiac : sea water > asystole / fresh water > hyperkalemia (Vfib)
18. Which one kills faster : sea water or fresh water drowning ? Fresh water drowning

Thursday 10/8/2023 (seminar)

1. Most common cause of : a. Sudden cardiac death > atherosclerosis in the coronaries / b. Sudden respiratory death > PE / c. Sudden neurological death > epilepsy
2. If we find a thrombus in one or more of the coronary arteries that led to a myocardial infarction > then the cause of death is the thrombus itself (here we might not find any cardiac changes) / if there is atherosclerosis but no thrombus + myocardial changes > then the cause of death is myocardial infarction

3. الشروع بالقتل / جر أداة حادة < جنايات

4. مشاجرة : مدة التعطيل > ١٠ أيام = إيذاء بسيط / مدة التعطيل < ١٠ أيام = جنايات

5. Tattooing (dead) = unwashable / tattooing (alive) = washable
6. Thermal hematoma vs epidural hematoma : no signs of trauma / crosses suture lines / rich in carboxyhemoglobin

7. Close shot : burn > inner collar / soot > outer collar

8. Dry drowning > mode of death : always asphyxia

9. Antemortem abrasion (vital reaction + reddish) / postmortem abrasion (no vital reaction
(ملمس و لون شبيهين بورق الزبدة +)

10. The 3 dimensional description (right, left/ up, down/ front, back) of a gunshot is in part based on the the morphology of the abrasion collar