Getting to grips with non-fatal strangulation: A brief overview of relevant concepts and considerations.

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Non-fatal strangulation (NFS) is the term used to describe instances where external pressure is applied to the neck and causes compression of blood vessels and/or the airways which can impair cerebral oxygen delivery without causing death. NFS is frequently used in instances of domestic, family and sexual violence (DFSV) and other forms of assault as a mechanism of exerting power and control and occurs within a broader pattern of gender-based violence. Compression of the neck is achieved via various mechanisms:

- manually via hand or hands,
- other body parts – forearm, knee, foot,
- headlock/choke hold – elbow around the neck,
- solid objects- bats, metal bars and
- ligatures.

What is the force involved when someone experiences NFS?

The application of the force to the neck depends on many variables and cannot be accurately quantified in each situation. ***It is important to recognise that a loss of consciousness can occur within seconds and death within minutes depending on the following***:

- Duration of the application of pressure
- Anatomy of the victim's neck
- Site and surface area of pressure applied
- Combination of body positions – assault is often dynamic
- Size of the victim and offender and the positioning of the mechanism – e.g. standing, or lying with pressure applied from above
- Shearing forces created by being lifted off the ground by the neck, or forced extension and twisting of the neck
- Gradual application of pressure, or on-off scenarios where there is repeated applications with the separation of time.

All of these variables contribute to differing amounts of force applied to the neck and risk of injury and mortality to the individual experiencing strangulation.

NFS is a common form of violence and is routinely assessed for in forensic examinations by clinical forensic physicians. Following the provision of education campaigns which have included first responders, Emergency Departments and Allied Health practitioners, it is gaining greater recognition with the use of dedicated screening and documentation. In

recognition of the seriousness of the act of NFS and it being a predictor of future homicide risk by an intimate partner (risk of homicide increasing by 7.48 times [1]) the state of Victoria introduced NFS as a stand-alone criminal offence which commenced in October 2024 as the *Crimes Amendment (Non-fatal strangulation) Act* 2024. The Act includes the terms chokes, strangles or suffocates, however it is somewhat limited in that it only applies in the context of family violence.

Strangulation in the context of consensual acts

The act of strangling a partner has been recognised in consensual sexual practise for quite some time using such terms as breath play or erotic/autoerotic asphyxia. Concerningly, however, more recently it has become recognised as a mainstream sexual act that young people currently believe to be a safe and common component of sexual interactions [2,3]. Strangulation has been normalised through pornography and popular culture (i.e. social media, movies, cartoons)[2]. A large qualitative Australian study involving 4702, 18-35 year olds found that 57% of these individuals reported ever being sexually strangled and 51% reported ever strangling a partner. This research demonstrated the existence of NFS normalisation in the sexual context and suggest that acts of NFS, more commonly referred to as choking by the general population, are experienced in greater numbers by women, transgender or gender diverse individuals[2]. It should also be acknowledged, however, that males in heterosexual and homosexual relationships are also participating as receivers of this sexualised activity and anecdotally through clinical forensic examinations it is also present in the adolescent population. Many individuals describe feeling pressured to conform to this perceived normalised sexual encounter[2,3], so in these situations where the risk cannot always be fully appreciated, one must consider, is true affirmative consent actually possible? Can a pre-established safe word be voiced when there is pressure applied to the larynx? Can an individual physically "tap-out" when they are being deprived of oxygen? Anecdotal evidence from clinical forensic medical examinations would suggest not.

Why are cases of NFS often missed by health practitioners – failure to ask & failure to disclose?

- Research in the field of clinical forensic medicine has shown ***that 25-50% of cases of NFS show no external signs of injury***. Concerningly, however, signs and symptoms can appear late and progress to serious life-threatening conditions [4,5,6].

- There are ***no signs or symptoms that are pathognomonic for NFS*** – a combination of signs and symptoms must be considered in conjunction with mechanism to assist with decision making around medical investigations.

- Victims may have no memory of the event i.e. loss of consciousness, presence of drugs or alcohol.

- In the setting of violence, the person experiencing violence may present with more serious/distracting injuries and fail to disclose NFS.

- Complex psycho-social factors to do with domestic, family and sexual violence may preclude disclosure. i.e. fear of repercussion, removal of children.

What anatomical structures are affected and what are the potential risks?

The neck does not have a bony cage to protect it like the chest and contains several at-risk vital structures if exposed to compression. Strangulation can be appreciated as a mixed type

of mechanical asphyxia, in which there is an overlap of circulatory, ventilatory and nervous events.

- Compression of the jugular vein (or veins) leads to venous backflow and venous congestion- with raised intracranial pressure leading to unconsciousness, brainstem dysfunction and if pressure is sustained, death.
- Compression of the carotid artery (or arteries) obstructs oxygenated blood flow to the brain causing asphyxia, brain injury and if sustained, death. Arterial dissection can occur with or without thrombosis, plus ischaemic or haemorrhagic stroke (via an embolic or occlusive aetiology).
- Compression and obstruction of the larynx, damage to soft tissues (thyroid gland) and cartilaginous structures, fracture of the hyoid bone – all can cause bleeding and swelling resulting in airway obstruction (which may be delayed) and if unrecognised, cause death.
- Rarely pressure on the carotid bodies can trigger cardiac dysrhythmias potentially causing cardiac arrest and death.
- Vertebral artery dissection should also be considered in forceful extensions and rotations of the neck.

What signs and symptoms should practitioners be looking for?

The ABCDE approach to physical examination is most useful for clinicians and is clearly documented in Victoire et al (2022).

Symptoms & red flags on history taking

- Loss of consciousness (pre-syncopal symptoms are helpful to elucidate)
- Confusion
- Amnesia (must also be considered in the context of drugs & alcohol)
- Severe headache/dizziness
- Visual changes
- Incontinence – urinary/faecal
- Pain with/difficulty with talking/breathing
- Pain with swallowing /drooling
- Vomiting (consider risk of aspiration)
- Hoarse voice (subjective – “I sound different” & objective – can you hear it?)
- Generalised neck pain
- PV bleeding in a pregnant patient
- Mechanism (i.e. lifted off the ground, hyperextension/rotation, ligature, body part, object)
- Previous episodes of strangulation -anoxic impact on the brain memory and concentration issues, mental health anxiety depression/PTSD
- Weakness

Signs not to miss – should complete a 360 degree observation of the neck

- Abrasions – fingernails, friction from ligatures, necklace.
- Bruises – application of blunt force: neck, chin, jaw, behind the ears.
- Swelling/subcutaneous emphysema/neck deformity
- Carotid bruit
- Focal neurological signs

Signs NOT TO MISS related to venous compression

- **Petechiae –** pin-point bruises 1-2mm, non-palpable ; non-blanchable
  Face, eyes, eyelids, scalp, mouth, ears/ tympanic membrane
  LOOK - anywhere above the level of compression, note a "Tide Mark" i.e. distinct commencement line of petechiae
- **Subconjunctival haemorrhages**

Please Note: there are common unrelated causes for both and practitioners must exclude.

Also be aware that NFS is commonly associated with other forms of violence – sexual & physical assault, threats with weapons – a large number associated with ***head injury!***

What do I do if I see or hear these signs or symptoms?

Send the individual to the Emergency Department for review and consideration for imaging and specialist consultation as needed. Patients presenting with obvious respiratory distress, airway compromise or neurological signs should be referred urgently via ambulance. Internal swelling and subsequent occlusion of the airway can be delayed, and awareness of this risk is usually advised for 36-72 hours. Medically cleared and discharged patients should be in the company of a reliable individual during this time and receive information regarding changes that should stimulate a return for further assessment. Vascular injuries and their sequelae have also been reported weeks and months following an NFS [8,9], so patient referral for follow-up should always be considered.

Referral to local domestic and family violence services and/or police/clinical forensic medical services and safety planning should be kept front of mind and consideration given to the presence of children and any mandatory reporting obligations.

If you see it or hear it- document it, as you may be the person of first disclosure of an incident and your notes will be valuable if a case proceeds to court. Clinical Forensic Physicians are frequently requested to examine other practitioners' medical notes and explain the findings in court saving the practitioners of first disclosure the worry of attending court cases.

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