



External foam and the post-mortem period in freshwater drowning; results from a retrospective study in Amsterdam, the Netherlands



G. Reijnen^{a, *}, M.C. Buster^b, P.J.E. Vos^c, U.J.L. Reijnders^d

^a Department of Forensic Medicine, Amsterdam Public Health Service, Rijnstate Hospital Arnhem, The Netherlands

^b Department of Epidemiology & Health Promotion, Amsterdam Public Health Service, The Netherlands

^c Rijnstate Hospital Arnhem, The Netherlands

^d Department of Forensic Medicine, Amsterdam Public Health Service, The Netherlands

ARTICLE INFO

Article history:

Received 14 February 2017

Received in revised form

8 July 2017

Accepted 24 July 2017

Available online 26 July 2017

Keywords:

External foam

Froth

Bodies recovered from water

Time of death

Drowning

ABSTRACT

Introduction: Determining the time of death of bodies recovered from water can be difficult. A feature of drowning is the presence of external foam. This study describes the presence of external foam in relation to the post-mortem period.

Method: The study utilizes a database of death reports dated between January 2011 and July 2016. For bodies recovered from fresh water, the presence or absence of external foam was noted.

Results: In this study, 112 death reports are included. Of these reports, 18 mentioned external foam, which account for 16.1% of the entire study population. In the population with a post-mortem period of less than 24 h, external foam was detected in 27.7% of cases. All 18 incidents with external foam had an estimated post-mortem period of less than 24 h.

Conclusion: In our study, external foam was only present in freshwater drowning cases with a post-mortem period of less than 24 h. Based on this finding, the presence of external foam may be useful as an additional indicator when estimating the time of death in freshwater drowning.

© 2017 Published by Elsevier Ltd.

1. Introduction

Drowning is the process of experiencing respiratory impairment from submersion or immersion in liquid.¹ Worldwide, drowning is a major issue; the World Health Organization estimates that about 388,000 people drown every year.²

The circumstances relating to bodies recovered from water vary and an autopsy should be performed to determine the exact cause of death.³ However, an American study of 123 subjects demonstrated that, despite thorough autopsy, the circumstances in submersion deaths (suicidal, accidental or homicidal) remained unclear in 41% of cases.⁴ In drowning cases, external foam can be present as a distinctive characteristic. External foam is defined as snow-white, fine-meshed foam, located around the mouth and/or nose of the deceased person as seen in Fig. 2.

The literature describes that the longer the period between the death and the performance of the autopsy, the lower the

prevalence of external foam.^{5,6} Thus it seems that external foam disappears as time and decomposition progress.

To determine the time of death it will be helpful to know how much time must pass after death before external foam can no longer be detected. The time of death can help to clarify the circumstances in which people are recovered from water. This study describes the post-mortem period in which external foam is visible in post-mortem external examinations of freshwater drowning cases.

2. Methods

2.1. Study design

This study retrospectively evaluates data of the post-mortem external examinations of bodies recovered from fresh water as well as subjects who were found still alive in fresh water, and died within 6 h of being found. This study involves bodies recovered from, or found in, the canals of Amsterdam, as well as from lakes, meres and ditches in the Amsterdam region (the Netherlands), between January 2011 and July 2016.

* Corresponding author. Department of Forensic Medicine, P.O. Box 2200, 1000 CE Amsterdam, The Netherlands.

E-mail address: greijnen@rijnstate.nl (G. Reijnen).

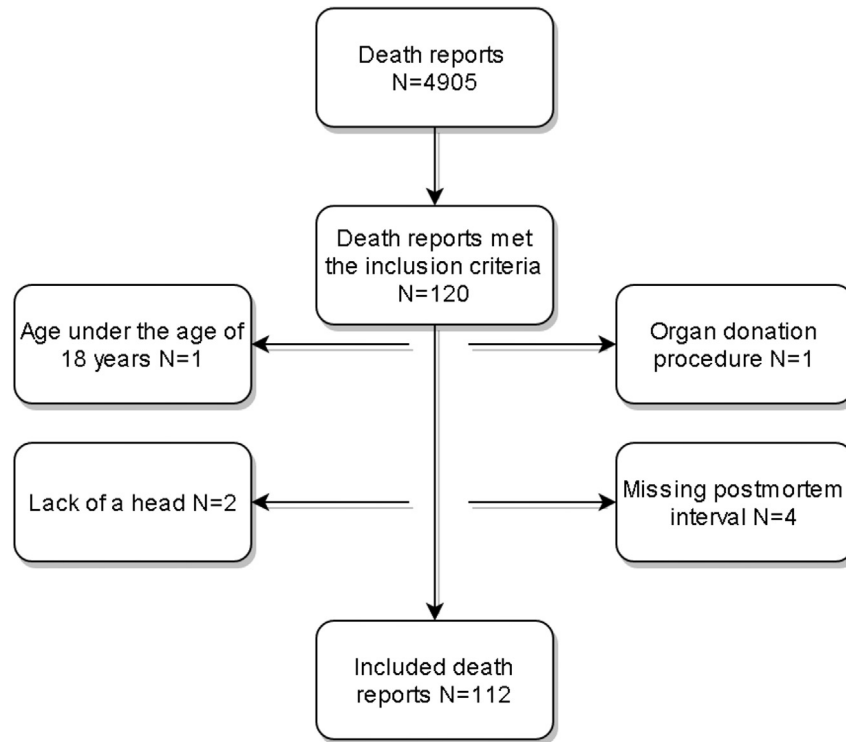


Fig. 1. Flowchart.



Fig. 2. External foam.

In total 120 death reports met the inclusion criteria. The following exclusion criteria were used:

- 1) Age below 18; N = 1
- 2) Organ transplant of heart and/or lungs (donor); N = 1
- 3) Missing head; N = 2
- 4) Missing estimate of post-mortem interval; N = 4

Fig. 1 shows an overview of the inclusion of cases.

The death reports that met the inclusion and exclusion criteria were entered into the database. For each of these death reports, the full text and any accompanying photographs were studied for the presence or absence of external foam.

2.2. Data collection

The digital register “Formatus” was used for the data collection in the period from January 2011 through July 2016. All unnatural deaths in the Amsterdam region, including Amstelland and Zaanstreek are systematically registered by forensic physicians in “Formatus”, making it a complete database. A pre-selection of post-mortem external examination reports (death reports) was provided, using the search function of the register. The database of death reports (N = 4905) was searched using the following terms: “drowning”, “water body”, “external foam”, “float” and “in the water”.

This pre-selection was then reviewed using the following inclusion criteria:

- 1) Found deceased in public or non-public fresh, outdoor water (N = 93); or
- 2) Found in public or non-public fresh, outdoor water and died within 6 h (N = 27).

2.3. External examinations

All external examinations were performed by forensic physicians. A total of 22 forensic physicians were involved in collecting the data. All of them had completed the post-academic training for forensic physicians and work according to an established protocol. An external examination involves a complete inspection and examination of the undressed body, toxicological urine and blood analyses, an exploration of the medical history and an investigation of the circumstances together with the detectives at the scene. Photographs were taken by the forensic physician and/or by the detective force.

The external examination was performed at the place where the body was recovered from the water or at the mortuary if the place of recovery was not suitable or safe. When a person died in hospital, the external examination was carried out there by a forensic physician. All external examinations took place within 1 h after a body was found. This could be achieved thanks to the 24/7 availability of the forensic physicians.

The estimation of the time of death was based on witness

Download English Version:

<https://daneshyari.com/en/article/4760590>

Download Persian Version:

<https://daneshyari.com/article/4760590>

[Daneshyari.com](https://daneshyari.com)