H74 A Case of Death Due to Asphyxia From the Use of Mechanical Restraints in a Hospital Environment: Always an Accidental Death?

Carmen Scalise, MD, University of Catanzaro, Catanzaro, ITALY; Fabrizio Cordasco, MD*, Università Magna Graecia CZ, Catanzaro, ITALY; Matteo A. Sacco, MD*, Chair of Legal Medicine, University of Catanzaro, Catanzaro 88100, ITALY; Francesco Sicilia, MD*, University Magna Graecia of Catanzaro, Catanzaro 88100, ITALY; Luigi De Aloe, MD*, Institute of Legal Medicine, Catanzaro 88100, ITALY; Massimo Iera, MD, Emergency Hospital of Crotone, Crotone, ITALY; Pietrantonio Ricci, PhD, University of Catanzaro, Catanzaro, ITALY; Isabella Aquila, MD, PhD*, Institute of Legal Medicine, Catanzaro 88100, ITALY*

Learning Overview: After attending this presentation, attendees will understand the risk linked to the use of mechanical restraints in psychiatric patients.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing the need for surveillance in order to prevent the use of illegal restraints.

Asphyxia is due to an impediment to the inflow of air into the respiratory tract.[1] Strangulation is the compression of the neck by using a lacing or other similar tool. The first factor involved is the nervous one, determined by the compression and stimulation of the vagus nerve. Death by asphyxia can occur with suicidal, homicidal, or accidental manner. Sometimes the difference between the three manners of death is not clear.

The death of a boy suffering from Down syndrome found dead in a psychiatric clinic between the bed and the floor of the room in which he was hospitalized is reported. The investigators carried out a judicial inspection of the clinic. The scene was examined by investigating the use of restraints in the other rooms of the nursing home and on the other patients. An autopsy was performed with analysis of the injuries on the body and measurement of the chest diameter. The investigators seized and analyzed the mechanical restraints used; they measured its dimensions and reproduced its closure. The data were analyzed and compared.

The analysis of the scene showed the presence of a mechanical restraint that kept the boy tied to the bed. The restraint was found around the boy's thorax and neck, and it caused a constrictive mechanical action on the anatomical areas described. The tool used was a restraint belt 115cm long and 12.5cm wide. The belt was not elastic and it had buttonholes; outside the buttonholes were two other restraining tools with a plastic closure and a special metal device with a magnetic closure. The restraints were photographed and analyzed at autopsy. In particular, the compatibility of the metal device with a magnetic closure was assessed and ascertained. It was also established that the metallic device could only be opened by using a magnet that presented a specific key ring of green color. Thus, the restraining belt was further closed through the metal device and by a magnetic closure. Therefore, it was clear that the use of restraints had caused the boy's death by strangulation. In particular, the forensic investigations showed that all the patients of the clinic were tied by these tools during the night with no possibility of movement. In this case, unfortunately, probably in an attempt to get out of bed, the boy remained accidentally trapped in the mechanical restraint, thus causing strangulation with constriction of the chest. But is it really an accidental death?

In this case, an analysis was carried out regarding the role of health care personnel and the real need to use mechanical restraints. Restraint refers to the use of physical, pharmacological, and/or environmental tools aimed at limiting the ability of an individual to move.[2] Restraint has a prevalence of 15.8% in hospitals and 68.7% in nursing homes.[3] Fall prevention is the main reason restraint is used. However, some studies have shown the ineffectiveness of such systems in preventing falls; on the contrary, they often cause death by asphyxiation or trauma.[4-6] It is necessary to consider the use of mechanical restraints as an extraordinary and not ordinary intervention. The choice of the medium to be used should be considered in relation to the individual case and it must be limited in time. Every patient subjected to restraint measures must be carefully monitored by specialized personnel. Increased surveillance of the nurse/patient relationship is necessary to reduce the use of restraints. In this case, the lack of surveillance of patients subjected to restraint is highlighted. Therefore, the failure to monitor the patient and the unjustified application of these tools caused an avoidable death. The case suggests the need for more surveillance on the use of restraints on psychiatric patients. Avoiding improper use of restraints is important as is the guarantee of the right to physical and personal freedom.

Reference(s):

1. Delmonte C., Capelozzi V.L. Morphologic Determinants of Asphyxia in Lungs. A Semiquantitative Study in Forensic Autopsies. *Am J Forensic Med Pathol*. 2001 Jun;22(2):139-49.
2. Achir Yani Syuhaimie Hamid M., Catharina Daulima N.H. The experience of restraint-use among patients with violent behaviors in mental health hospital. *Enferm Clin*. 2018 Feb–Jun;28 Suppl 1:295-299.
3. de Vries O.J., Ligthart G.J., Nikolaus T. European Academy of Medicine of Ageing-Course III. Differences in period prevalence of the use of physical restraints in elderly inpatients of European hospitals and nursing homes. *J Gerontol A Biol Sci Med Sci.* 2004 Sep;59(9):M922-3.
4. Capezuti E., Strumpf N.E., Evans L.K., Grisso J.A., Maislin G. The relationship between physical restraint removal and falls and injuries among nursing home residents. *J Gerontol A Biol Sci Med Sci*. 1998 Jan;53(1):M47-52.
5. Capezuti E., Maislin G., Strumpf N., Evans L.K. Side rail use and bed-related fall outcomes among nursing home residents. *J Am Geriatr Soc*. 2002 Jan;50(1):90-6.
6. Evans D., Wood J., Lambert L., Fitzgerald M. Physical restraint in acute and residential care: a systematic review. Adelaide, S. Australia, Australia: Joanna Briggs Institute for Evidence Based Nursing and Midwifery. *Systematic Review*; 22. 2002

Forensic Science, Mechanical Restraints, Hospital

*Presenting Author