



The rapid identification of railway disaster victims by DNA analysis

P. Hoff-Olsen *, B. Mevåg, K. Ormstad

Institute of Forensic Medicine, University of Oslo, Oslo, Norway

At 1:12 PM on the 4th of January 2000, a local train and an express train crashed in a wooded area, approximately 150 km north of Oslo. Both trains were expected to move at a speed of 80–90 km/h before the incident. The northbound local train was expected to carry 15 passengers and 2 employees. The southbound express train was expected to carry 81 passengers and 2 employees. A diesel fueled locomotive and several passenger wagons tipped over and were fiercely ignited by the fuel. At 7:00 PM on the day of the accident, the fire was extinguished and by midnight the same day 11 casualties were brought out from the scene. At day 2 after the disaster a total of 18 deceased were recovered from the scene. At day 4 the 19th and last victim was brought out.

For the victim identification it was decided to use DNA profiling in addition to traditional means, i.e. forensic pathology and odontology. Furthermore, it was decided only to use PCR-based methods, due to the expected degradation of the material.

A total of 24 bodies and body parts were found at the scene. Blood samples from first degree relatives of 17 of the deceased were collected as reference material. A surgical pathology tissue block had to be used as reference material for one of the victims. Reference biological material was not available for one of the subjects. For the extraction of DNA from all tissue and blood samples the phenol–chloroform extraction was used, partly as a rapid truncated method. DNA from a single sample of skeletal tissue was extracted by a silica method. DNA from all the reference samples was extracted by a Chelex-based method. All samples were amplified with the AmpFISTR SGM plus kit®.

By the evening of day 3 after the accident, all samples received in the afternoon of day 2 were successfully analyzed. Some samples arrived at our laboratory by the afternoon of

* Corresponding author. Rettsmedisinsk Institutt, Rikshospitalet, 0027 Oslo, Norway. Tel.: +47-23-071258; fax: +47-23-071260.

E-mail address: per.hoff-olsen@labmed.uio.no (P. Hoff-Olsen).

day 5. These were successfully analyzed by the next morning. All 18 victims with available reference samples were identified by DNA analysis. This work represents a further example of DNA profiling as a rapid and safe way of mass disaster victim identification. The choice of DNA extraction methods, and sample collection at the scene will be further discussed.