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Analysis of the medical causes of death in cerebral palsy

Étude des causes médicales de décès dans la paralysie cérébrale

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Abstract

Aim. – To investigate causes of death and age at death in cerebral palsy subjects compared with the general population.

Method. – Analysis of data supplied by the centre of epidemiology on the medical causes of death within the National Institute of Health and Medical Research in France was conducted. Three thousand and thirty-one death certificates indicating a diagnosis of cerebral palsy (ICD-10 code G80) were reported between 2000 and 2008.

Results. – Median age at death was between 45–54 years and principal cause of death (24%) comprised the category “symptoms, signs, and abnormal results of clinical and laboratory tests, not classified elsewhere”. Of these, 66% were related to the circulatory and respiratory systems. “Diseases of the respiratory system” were the second most common cause of death (19% compared with 6% in the French general population). The third most common cause of death was “diseases of the circulatory system” (15% compared with 29% in the French general population). While deaths caused by tumour pathologies in the general population are the most common cause of deaths, these represented only 7% of deaths in subjects with cerebral palsy.

Interpretation. – These results concur with other published data, i.e. subjects with cerebral palsy die younger than the French general population, and the principal causes of death are respiratory and circulatory problems. This study emphasises the importance of access to epidemiological data about the French cerebral palsy population.

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Keywords: Cerebral palsy; Mortality; Epidemiology

Résumé

Objectif. – Déterminer les causes et l'âge de décès d'une population de patients atteints de paralysie cérébrale (PC) comparée à la population générale.

Patients et méthode. – Analyse des données fournies par le centre d'épidémiologie sur les causes de décès. Trois mille trente et un certificats de décès comportant le diagnostic de paralysie cérébrale de l'année 2000 à 2008 ont été répertoriés.

Résultats. – L'âge médian de décès dans notre population se situe entre 45 à 54 ans. La cause principale de décès (24 %) est la catégorie : « symptômes, signes et résultats anormaux d'examen cliniques et de laboratoire, non classés ailleurs » dont 66 % concernent la catégorie symptômes et signes relatifs aux appareils circulatoire et respiratoire. Les maladies de l'appareil respiratoire sont la deuxième cause de décès (19 % contre 6 % dans la population générale). La troisième cause de décès sont les maladies de l'appareil circulatoire (15 % contre 29 % dans la population générale). Les tumeurs ne sont que la 4^e cause de décès chez les personnes atteintes de PC alors que cette catégorie est la 1^{ère} cause de décès dans la population générale.

Discussion. – Cette étude confirme ce qui est rapporté dans la littérature anglo-saxonne. Les personnes atteintes de PC meurent plus jeunes que la population générale, les causes principales de décès sont : respiratoires puis circulatoires. Elle souligne l'importance de disposer de données épidémiologiques concernant la population PC en France qui en l'absence de données fiables ne permet pas de comparer nos résultats à ceux de la littérature.

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Mots clés : Paralysie cérébrale ; Mortalité ; Épidémiologie

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1. English version

1.1. Introduction

Cerebral palsy (CP) is the most frequent cause of motor handicap in children. The prevalence of CP is stable and it is estimated to affect 2 to 3 per 1000 births in Europe. Life expectancy of CP sufferers varies according to the severity of the motor and cognitive handicap [3,6,13,17]. According to Hemming et al., 85% of CP patients who are 20 years old will survive until they are age 50 [4]. Reid et al. reported similar figures in a study on 3507 CP patients monitored for a period of 34 years. Results showed that survival rate at age 20 years was 89%. The strongest predictive factor of mortality was no independent deambulation. Epilepsy or severe intellectual disability were additional predictive factors of mortality in this study [11].

Most authors report a higher mortality rate in this population compared with the general population, along with differences between the populations regarding causes of death. Hemming et al. conducted a cohort study investigating the causes of death in a population of 341 adults with CP. The findings were that the relative risk of death was higher for all ages when compared with a cohort of age-matched subjects [4]. The most frequently reported causes of death were respiratory and circulatory diseases [2,9,11,14,19].

A literature search did not reveal any other French study investigating the causes of mortality in CP and therefore the aim of this study was to improve available knowledge with regard to the causes of mortality in the CP population so that preventive measures can be prioritised and implemented in the future.

This paper summarises the results of a retrospective study on the medical causes of death of CP patients over a 9-year period between 2000 and 2008, using data supplied by the “centre of epidemiology on the medical causes of death” (Cépi-Dc – INSERM). This study determined the death rate as a function of age, the different causes of death in this population and to compare these results with the known death in the French general population data.

1.2. Method

An investigation was carried out on all deaths recorded from 2000 to 2008 in which a diagnosis of CP appeared as one of the initial or associated causes of death. This was defined as code of G80 according to the International Classification of Diseases and Related Health Problems 10 (ICD-10) classification. These data were supplied by the centre of epidemiology on the medical causes of death (Cépi-Dc – INSERM) and the causes of death were classified according to the 16 ICD-10 categories (Appendix 1).

Analysis initially focused on the principal causes of death, but as the study commenced, it became evident that some of these could not truly be considered as the principal causes of death. For example, CP itself should not be considered the principal cause of death as this pathology alone cannot lead to death (code ICD G80). Furthermore, traumatic injuries, poisoning and some other consequences of external factors (code ICD-10 S00 to T98), factors influencing health status, and reasons for contacting the health services (code ICD-10 Z00 to Z99) were not considered to be principal causes of death since it was not possible to make any meaningful comparisons with the general population.

In cases where the initial cause of death was considered valid, i.e. not coded as G80, S00–T98 and Z00–Z99, then this was recorded as the principal cause of death, but if the initial cause of death was not considered valid, i.e. codes G80, S00–T98 or Z00–Z9930, then the principal causes of death were redefined. In such cases the first associated cause of death was noted and if considered valid then this was recorded as the principal cause of death. However, if the first associated cause was not considered valid, then a suitably qualified doctor studied the second and subsequent associated causes to establish what might have been the real cause of death (Fig. 1).

Statistical analysis of these data and production of graphs was performed using Microsoft Excel software. It was not possible to perform a calculation of a standardised rate in the CP population as there was no information on the structure by

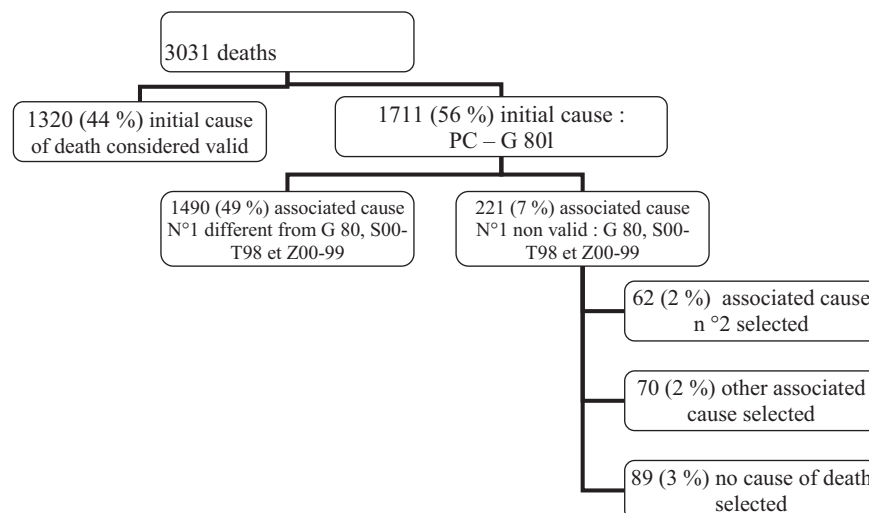


Fig. 1. Distribution of causes of death.

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