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ORIGINAL ARTICLE

Cervical incompetence and cerclage in Denmark 1980–1990

A register based epidemiological survey

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Objective. To assess the incidence rate of cervical incompetence diagnoses in Denmark 1980–1990 according to maternal age, to analyse regional variations, to investigate how often cerclage is applied, and finally to estimate abortion rates among women with cervical incompetence with and without cerclage.
Design. A register-based retrospective cross section study.
Setting. All Danish gynecological departments.
Material and methods. Since 1977, all hospitalized patients in Denmark have been centrally recorded by diagnosis according to the ICD classification and by operation codes in The National Patient Register. From this database, all women with cervical incompetence (CI) and cerclage in the period 1980–1990 were identified. From the same database all cases of spontaneous abortions were registered.
Results. A total of 2756 cases of cervical incompetence were registered in the period 1980–1990, corresponding to an incidence rate of 4.6/1000 births. The risk of cervical incompetence increased from 2/1000 births among women 15–19 years old to 7.5/1000 births among women 35–39 years old. The incidence rate of the CI-diagnosis fell 44% from 1980 to 1990. The incidence rates in different counties ranged from 1.7/1000 births to 10.0/1000 births. The average length of stay in hospital among patients with cervical incompetence was three weeks. Among patients with cervical incompetence, 61% were treated with cerclage. This per cent increased from 29% among women 15–19 years old to 68% among women 35–39 years old. 13.5% of women with CI experienced spontaneous abortion. This percentage increased from 12% for women 15–19 years old to 17% among women 40–44 years old ($p<0.01$). Among women with CI and cerclage, the abortion rate was 17.6%.
Conclusion. In the period 1980–1990 the incidence rate of cervical incompetence in Denmark was on the average 4.6/1000 births. The incidence rate of the CI-diagnoses has fallen significantly during the last decade, and it increases four-fold with increasing age. Six out of ten patients with cervical incompetence were treated with cerclage.

Key words: cervical incompetence; cerclage; epidemiology; spontaneous abortion; Denmark

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The majority of maternity wards manage 2–6000 deliveries annually. Overall figures from the US, UK and Australia indicate an incidence rate of cervical incompetence of 2–5/1000 births (1–3). This means that each ward experiences 2–30 patients with cervical incompetence (CI) each year. This circumstance probably explains the lack of descriptive epidemiological studies on that diagnosis.

Since 1977, all hospitalized patients in Denmark have been centrally recorded in *The National Patient Register* (NPR) including discharge diagnosis according to the ICD-classification and operation

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Abbreviations:
CI: cervical incompetence; NPR: The National Patient Register.

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codes. This database is available for scientific purposes. With a population of about five million people, this database permits stratified calculations of incidence rates of even rare diseases or operations. At the same time, several analytical studies are possible by correlating one diagnosis with others, stratified according to age, address, marital status, etc.

The aim of this study was to assess the incidence rates of cervical incompetence diagnoses and cerclage operation codes according to age and year, to investigate regional variability in these parameters and the outcome among patients with cervical incompetence with or without cerclage. The study period was 1980 to 1990.

Material and methods

Each time a patient is discharged from a Danish hospital, he or she is coded by at least one ICD-diagnosis. Analyses based on data from NPR stand or fall with the validity of the codes in the NPR. Generally the validity of operation-codes is high, while the validity of clinical diagnoses is variable (4, 5). Cervical incompetence has a specific ICD-diagnosis (634.91). In Denmark these five figures are supplied with figures for different modifications. Only diagnoses without modification were included in the study. One pregnant woman with cervical incompetence may be admitted several times to hospital during one pregnancy. To get reliable figures on afflicted pregnancies a restriction procedure was brought out so that a minimum interval of 24 weeks (40–16 weeks) was required before one woman was allowed to count twice or more.

When calculating incidence rates of cervical incompetence according to age and county, the average annual number of women with cervical incompetence was related to the number of births in 1985 in that age group or county, as the number of births in 1985 (total 53,989) approximated the average annual number of births in the period 1980–1990.

The cerclage operation has a specific operation code; 6506. All women with that operation code were included in the study.

The number of spontaneous abortions was counted within a period of 14 weeks from the time the CI-diagnosis was found in the NPR.

Test of significance was performed using the chi square test.

Results

A total of 3995 cases of cervical incompetence was registered in the NPR from 1980 to 1990. Performing restriction for re-admissions during one pregnancy, the total number of cervical incompetence diagnoses were reduced to 2756 or by 31%, indicating that on the average, each woman was admitted to hospital 1.5 times during each pregnancy with cervical incompetence. This figure corresponded to an average incidence rate of cervical incompetence of 4.6/1000 births. From 1980 to 1990, the incidence rate decreased from 5.2/1000 births to 2.9/1000 births or with 4% per year.

The incidence rate of cervical incompetence went up with increasing age from 2.0/1000 births among women 15–19 years old to 7.5/1000 births among women 35–39 years old (Fig. 1).

The incidence rate of cervical incompetence diagnoses in 16 county regions in Denmark ranged between 1.7/1000 births to 10.0/1000 births or six-fold.

The average length of stay in hospital among patients with cervical incompetence was three weeks.

Among 2756 patients with cervical incompetence, 61% (1678) were registered with a cerclage

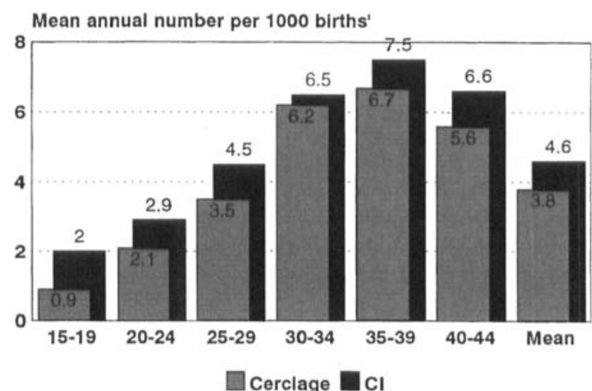

Fig. 1. Cervical incompetence (CI) and cerclage in Denmark 1980–1990, according to age.

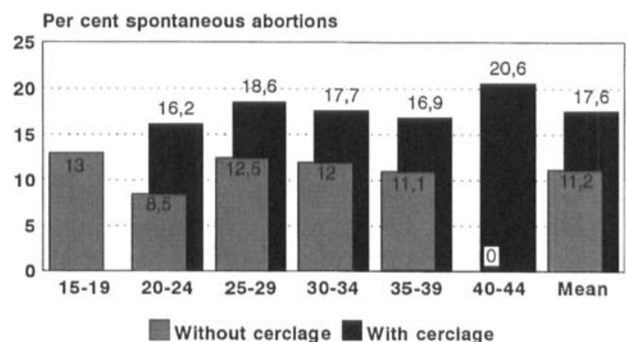

Fig. 2. Spontaneous abortions among women with cervical incompetence with/without cerclage in Denmark 1980–1990 according to age.

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operation code within a period from eight weeks before until 14 weeks after the CI-diagnosis figured in the NPR. This percentage increased from 29% among women 15–19 years old to 68% among women 35–39 years old. However, the total number of cerclage codes was 2273, corresponding to an incidence rate of cerclage of 3.8/1000 births. This means that one in four patients with cerclage was not found with a CI-diagnosis within a period from eight weeks before until 14 weeks after the operation code was figuring in the NPR. This percentage was identical for different age groups. The incidence rate of cerclage went up with increasing age from 0.9/1000 among women 15–19 years old to 6.7/1000 births among women 35–39 years old (Fig. 1). The incidence rate of cerclage in different counties in Denmark ranged from 1.5/1000 to 8.4/1000 births or about six-fold.

13.5% of women with CI experienced spontaneous abortion. This per cent increased from 12% among women 15–19 years old to 17% among women 40–44 years old. Among women with cerclage, the abortion percentage was 17.6% (400/2,273) without major age differences (Fig. 2). Among women with cervical incompetence without cerclage, only 11.2% (121/1,076) had spontaneous abortion ($p<0.001$) (Fig. 2).

Discussion

Many precautions have to be taken concerning data established from population statistics. Although all diagnoses in the NPR are coded by doctors, spot tests on the NPR-codes have revealed a significant degree of misclassification at least for some diagnoses (4, 5). The major problem concerning cervical incompetence is the lack of a specific test or criterion for the accurate diagnosis (6). There is no doubt that some patients with cervical incompetence are misclassified as e.g. imminent abortion (ICD 632.39), partus praematurus imminens (ICD 634.90) or habitual abortion (ICD 643.00). The only indication for a cerclage operation is cervical incompetence. Therefore, in principle, all women with cerclage were expected to be registered with the CI-diagnosis as well. The percentage of women among cerclage patients who were registered with a CI-diagnosis was 75%. This finding does not necessarily imply that on average 25% of women with cervical incompetence are not coded as such, but it suggests that some women with cervical incompetence are not coded as they ought to be.

The diagnosis cervical incompetence depends on a characteristic history and a clinical presentation. There may be differences between maternity wards in applied criteria justifying the diagnosis and in attitudes towards cerclage. This circumstance probably accounts for a substantial part of the regional variability in the incidence rates of CI and cerclage.

The validity of operation codes is generally high. The incidence rates of cerclage according to year were closely correlated to the incidence rates of cervical incompetence. This circumstance suggests that misclassification biases were not responsible for the major trend in incidence rates of cervical incompetence during the 11-year study period. Minor influences, however, cannot be excluded. The declining trend may partly reflect a generally increasing attention to fulfilling the diagnostic criteria for the CI-diagnosis. A certain declining occurrence of CI among pregnant Danish women may, however, also be in effect.

The correlation between the incidence rate of cervical incompetence and age does not seem to be substantially influenced by misclassification biases, as the per cent of missing CI-diagnoses among cerclage patients was very constant over the age groups. The finding may partly reflect the fact that it is easier to be sure of the CI-diagnosis in the second or subsequent pregnancies than in the first.

The overall incidence rate of CI found in this study corresponds with figures previously published (1–3).

Of immediate concern was the 57% higher abortion rate among women with cervical incompetence and cerclage compared with women without cerclage. It is important to realize, however, that this study is a cross section study without any kind of randomization. It is highly probable that women with cervical incompetence who receive cerclage represent a clinically more severely attacked group than those among whom cerclage was not applied. This circumstance probably explains the whole difference in the abortion rate between the two groups of patients with cervical incompetence. Unfortunately, we have no immediate possibility of investigating these circumstances further.

If maternity wards in Denmark could agree on the criterion for using the CI diagnosis, and on attitude towards the use of cerclage, the National Patient Register could offer an important opportunity for short and long term studies of the consequences of CI and cerclage among pregnant women.

Conclusion

In Denmark, one patient with cervical incompetence occurs for every 200 births. The incidence rate of the cervical incompetence diagnosis has fallen significantly during the last decade. It increases four-fold with increasing age. Six out of ten pa-

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tients with the diagnosis of cervical incompetence are treated with cerclage.

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