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ASTHMA MORTALITY IN SWEDEN AMONG CHILDREN AND ADOLESCENTS DURING THE PERIOD 1952-1972

By

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In the 1960's an increase in the mortality from bronchial asthma was recorded in England, Wales and Australia (1, 3, 9, 15, 16). This was most apparent in the age-group of 4-15 years. More recent accounts from these countries have shown a lower rate of asthma mortality since, comparable with that of the 1950's (2, 4, 8). In Scandinavia, similar observations have been made in Denmark and Finland (10, 11). On the basis of these reports and in cooperation with the Swedish National Central Bureau of Statistics, the trend in the mortality from asthma among children and adolescents has been studied in Sweden during the period of 1952-1972.

MATERIAL AND METHODS

All death certificates in Sweden from the years 1952-1972 containing a principal diagnosis of bronchial asthma have been scrutinized in the age-group of 1-24 years. The material comprises 183 cases, i.e. 97 males and 86 females. Children who died before the age of 1 year with a diagnosis of bronchial asthma were excluded. The reason for this exclusion was the difficulty in establishing a correct diagnosis during the first year of infancy. The upper age limit of 24 years was set arbitrarily. The death certificates have provided information regarding age, place, time of death and contributory cause. Supplementary details were added after checking the hospital case histories and the patients'

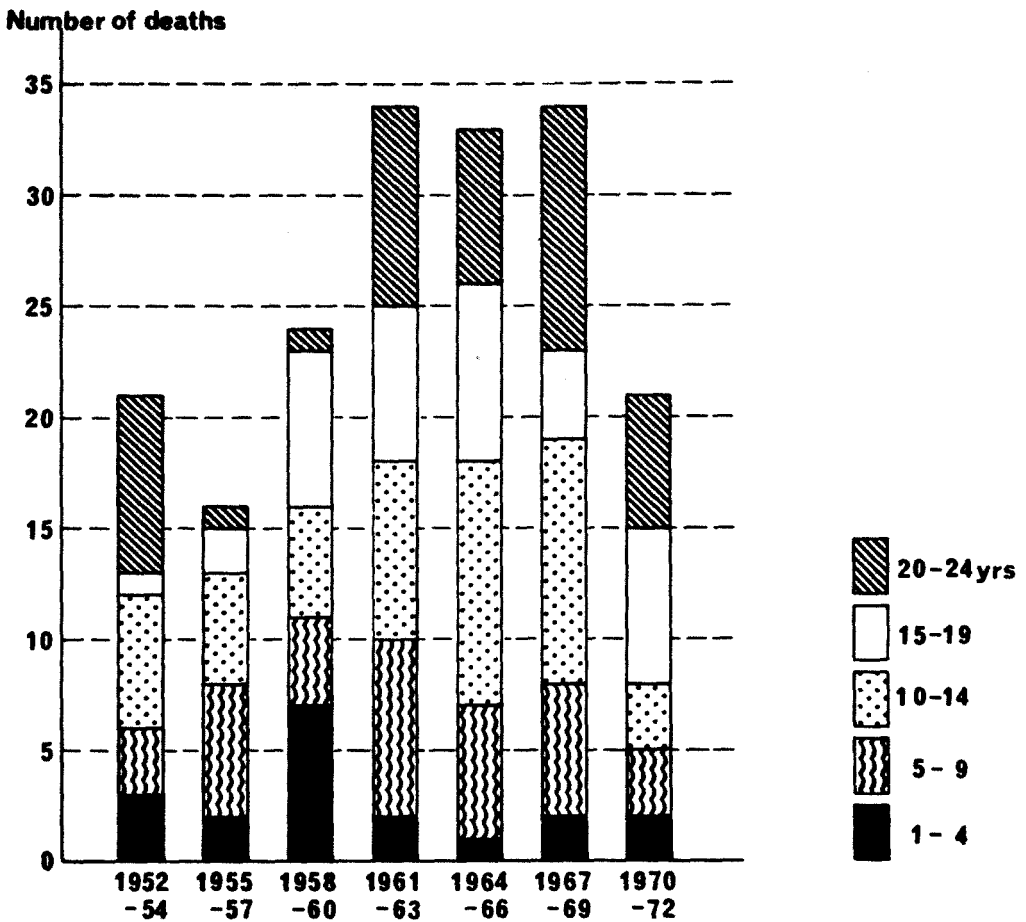


Fig. 1.

Total number of asthma deaths in children and adolescents aged 1-24 years between 1952 and 1972.

cards. Attempts were made to assess the exact quantity of medicine consumed before and during the final stage of life, but available data did not prove reliable. Before analysis, the material was divided into groups of 3-year-periods, from 1952-1954 up to and including 1970-1972.

RESULTS

The present investigation discloses a marked increase in the number of deaths from bronchial asthma in the age-group of 1-24 years during the greater part of the sixties as compared with the fifties.

Towards the end of the sixties and during the first part of the seventies this trend changed and a definite decrease be-

TABLE 1
Place of Death of 183 Asthma Cases, Aged 1-24 Years.

	Number of deaths
Outside hospital	69 (37 %)
During transport	27 (15 %)
In hospital	87 (48 %)

came evident (Fig. 1). This reversal occurred in 1968, the number of recorded deaths being 10 as against 16 in 1967. No difference in the mortality rate was noted between the sexes.

In a division of the material into two groups (a purely pediatric group of 1-14 years and an adolescent group of 15-24 years) when the deaths are correlated with the mean population in each age-group, a fairly similar trend is seen in both groups up to and including the 1960's. During the first part of the seventies the two groups show a divergent tendency, with a higher mortality in the adolescent group (Fig. 2).

An estimate of the trend in the average age at death during the period of 1952-1972 reveals a slightly higher age at

Per 1 million

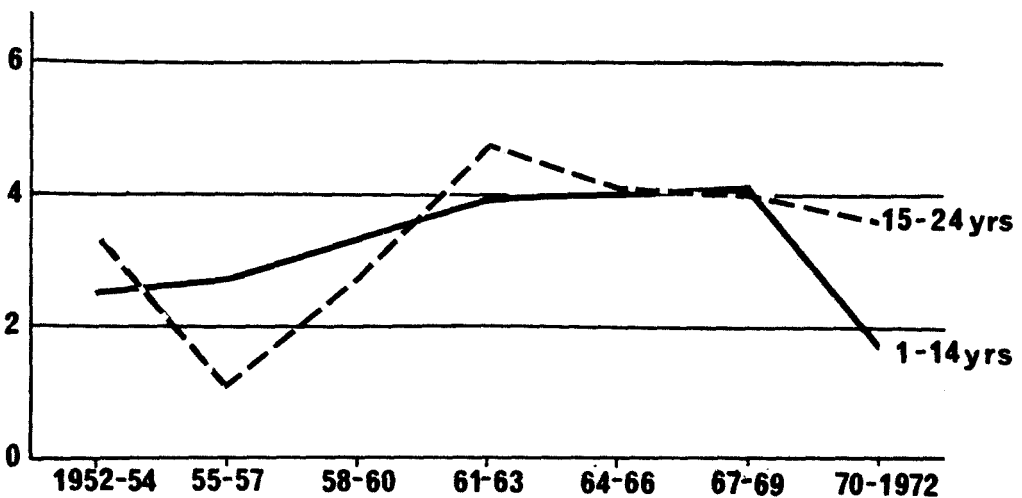


Fig. 2.

Deaths from asthma per 1 million children, 1-14 years, and per 1 million adolescents, 15-24 years, during the period 1952-1972.

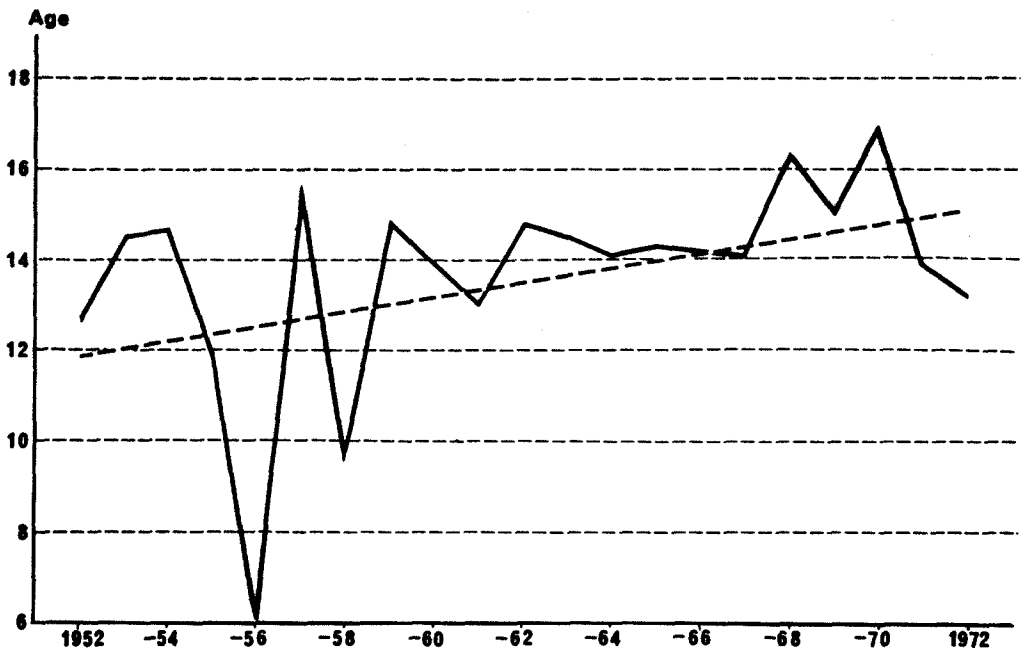


Fig. 3.

Trend of average age at death in 183 asthma cases, 1-24 years old, during the period 1952-1972.

death (Fig. 3). There was no such difference between the two sexes.

Table 1 shows that approximately half the deaths took place in hospital, while the rest happened at home or on the way to hospital. The same observation applies to the whole period of investigation.

DISCUSSION

In the last few years there has been a lively debate as to the reason for the increase in mortality from asthma in the middle of the 1960's. Also the variations in the mortality rate in different countries have been speculated upon (2, 19, 20). Furthermore, the abuse and consequent overdosage of potent adrenergics in pressurized aerosols, especially isoprenaline (21), have been discussed. Inter alia, it has been discussed whether certain isoprenaline metabolites can act as potent β_2 -receptor-blockers, leading to an increased use of pressurized

aerosols and a risk of intoxication (12). Also the effect of isoprenaline on the heart muscle has been discussed (5).

A certain correlation is conceivable between an increase in the mortality rate and the sales of pressurized aerosols in some countries. However, the causative connection has not been properly established.

Several investigators assert that the earlier conception of isoprenaline being the underlying cause of increased asthma mortality should, for the time being, be abandoned (7, 13, 14). It is reported from Australia, among other places, that the higher mortality in asthma recorded there in the middle of the sixties has strongly decreased, despite a continual increase in the sales of isoprenaline and orciprenaline aerosols (4). In Sweden the sales of pressurized aerosols decreased toward the end of the sixties, increasing again at the beginning of the seventies in connection with the introduction on the market of selective β_2 -receptor-stimulators in the form of salbutamol and terbutaline.

The mortality among children and adolescents in Sweden began to fall in 1968, i.e. approximately 3 years before the aerosols of today were introduced, and at a time when isoprenaline and orciprenaline completely dominated the market (22). This would indicate that other factors must have been active in causing the increase in mortality from asthma in the middle of the sixties.

A prolonged use of corticosteroids in asthma treatment is, possibly, contributory to the increased rate of mortality. As treatment with steroids became gradually more common in the fifties, a comparison with the thirties and forties regarding mortality in the respective age-groups would have been of considerable interest. However, it is impossible to obtain comparable figures of asthma mortality in children and adolescents for the period before the cortisone era as against those of the present investigation.

It is well known that high dosages of theophyllamine may cause intoxication and lead to death. Theophyllamine has, nevertheless, long been used in the routine treatment of asth-

ma, and it is unlikely that it was used with less discernment in the sixties than earlier.

Also other factors, such as inadequate treatment of asthma patients dependent on steroids in the acute stage, and extensive bronchial plugging, have been suggested as clear causes of death (6, 17, 18).

In the 1950's new improved methods were introduced for the treatment of acute attacks of asthma, e.g., intravenous fluid therapy, modern respirator therapy, steroid therapy, etc. In all probability, many asthma patients who, statistically, would have died in the fifties have, thanks to improved treatment methods, been given a prolonged period of survival lasting until the middle of the sixties. They have thus contributed to the increased rate of mortality in that period. The trend towards a higher age at death, ascertained in the present investigation, lends support to this assumption.

It is noteworthy that more than half of the deaths took place at home (37 per cent) or on the way to hospital (15 per cent). The high frequency of deaths outside the hospital remained constant during the whole investigation period. This may be attributed either to a very violent onset of the fatal attack, or to a prolonged delay at home in the hope of being able to manage with available sympathomimetics.

The present investigation has shown that the earlier increase in mortality from bronchial asthma in children and adolescents has changed to a clear decline in the rate of mortality. A slight trend towards an averagely higher age at death has been observed. It has been pointed out that there are probably many factors underlying the fluctuations in the mortality. Improved methods of treatment in the fifties may be the reason for divergences in the mortality in the sixties. Likewise, improved treatment and a better understanding of the seriously asthmatic child may have contributed to the lower frequency of asthma death in the youngest age-groups.

SUMMARY

Asthma mortality in Sweden during the period of 1952–1972 in the age-group of 1–24 years, comprising a total of 183 cases, has been studied. As compared with the 1950's, there is a conspicuous increase in the number of deaths during the greater part of the sixties, reaching a maximum in 1967. Since then the mortality has shown a marked decrease. Further, a trend towards an averagely higher age at death has been ascertained in the latter part of the investigation period. The factors underlying the conspicuous variations in mortality rate were discussed. It was emphasized that the abuse of sympathomimetics in pressurized aerosols could not be accepted as the one and only cause. In all probability, the increase in the mortality during the 1960's can be attributed to a number of factors.

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