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IS IT POSSIBLE TO LOWER THE LETHALITY RATE OF TETANUS? *

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SUMMARY

The lethality rate of tetanus in Portugal is 55 %, and about 165 cases are notified yearly. In the last ten years, 1968-77, 299 cases of tetanus were treated in the ICU of the Coimbra University Hospital, with a lethality rate of 28,4 %. However, in the last 2 years (53 cases) the lethality rate was 20,8 %. This difference is not significant ($\chi^2 = 1,4$). A shift towards the older age groups is now accepted. Of the 299 tetanus cases 113 were aged 60 or more (37,7 %). The lethality rates in this age group were:

60-69	71 cases	29,6 %
70-74	27 cases	40,7 %
≥ 75	15 cases	66,7 %

Of the 53 cases treated in the last 2 years, 27 were over 60 years (50,9 %). The patients aged between 60 and 69 hardly affect the overall lethality. The increase is more evident in the age groups above 70. The tendency for the disease to occur in patients over 60, associated invariably with chronic disease, poor cardiovascular or pulmonary status, diminished defenses, etc., favours the occurrence of the serious complications of the process as well as those derived from intensive care management. We therefore do not feel that there will be a reduction in the lethality rate with the present therapeutic possibilities.

According to statistics form the National Health Department, the incidance and lethality rate of tetanus in Portugal have decreased (table 1).

Table 1

Incidence and lethality rate of tetanus in Portugal

Year	1962	1965	1970	1971	1972	1973	1974	1975
Incidence per 100.000 inhabitants	5,0	4,0	2,7	2,4	2,2	1,9	2,2	1,7
Lethality per 100.000 inhabitants	3,3	2,4	1,5	1,4	1,12	1,04	1,10	0,83

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Although tetanus become compulsorily notifiable since 1958, the data presented are an underestimate because the disease is not always notified. The lethality rate, according to this data averages 55 per cent. This percentage may reflect the availability of intensive care units.

Nowadays when it is necessary to know if the mortality of a certain disease may be modified, one must refer to the levels obtained with the most modern methods of treatment. In this issue, we refer to treatment in intensive care units only.

The results obtained do not include the newborn, and though similar they are not exactly the same, as shown in table 2.

Table 2

Lethality of tetanus according to different authors

Place	Author	Number of cases	Number of deceased	Lethality percent
Paris	Vic Dupont et al.	120	40	33,3
Bruxelles	Cornil et al.	50	12	24,0
Oporto	M. Lopes et al.	60	19	31,7
Paris	Goulon et al.	210	52	24,7
Bristol	J. Macrae	153	31	20,3
Paris	Grosbuis et al.	171	44	25,7
Sweden	E. Eriksson	165	37	22
Coimbra	Carrington da Costa et al.	299	85	28,4

From their experience of 1.500 cases, Vic-Dupont et al [1] took the last 120 patients of which 33 per cent were casualities, stating that mortality ranges were between 20 and 35 per cent. It must be added that this group did not include mild cases of tetanus.

Cornil et al [2] considered two periods. During the first period (1964-1966), 8 of 17 patients died (lethality rate, 47 per cent). During the second period (1967-1973), there were only 4 deaths among 33 patients due to the introduction of therapeutic modifications (lethality rate, 12 per cent).

The higher lethality rate presented by the Oporto team [3] can be justified because they didn't treat mild cases.

Grobuis et al [4] present lethality rates between 13,6 per cent in 22 patients, treated during 1969, and 32,1 per cent in 28 patients treated during 1966.

Eriksson [5] states that during the 1960's, the lethality rate of 22 per cent in Sweden results from the fact that in the first half of the decade it was 24 per cent, having dropped to 18 per cent the second half. He added that in his Hospital no patient with tetanus has died in the last 20 years.

Although the overall mortality presented is similar, the several authors point out that during certain periods or in certain fractions of their samples, the lethality rate is lower, which can lead us to expect a reduction in mortality.

If we wished to compare all these results, it would be necessary to be certain of the possibility of that comparison. Various factors would have to be considered, amongst them management, medical and nursing surveillance, the severity of the disease, age and status of the various organs, size of the samples and also other aleatory factors.

The latter were responsible for a lethality rate of 19 per cent in 21 patients in 1964 and 79 per cent in 28 patients in 1966, in a series presented by Gautier et al.[6]

During the last ten years we treated 299 cases of tetanus. Treatment is not essentially different from that practised in similar units and consists in heavy sedation with diazepam, tracheostomy, artificial ventilation, curarisation with pancuronium and heparin in prophylactic dosages.[7] Tetanus toxoid, as well as heterologous serum and human anti-tetanus immunoglobulin were used. According to our experience there is no statistical advantage in their use.

Table 3

Resudts obtained with no serum therapy, heteroligous serum therapy and human anti-tetanus immunoglobulin

	Cured	Deceased	Total
No serum therapy	22	5	27
Heterologous serum therapy	10	6	16
Human anti-tetanus immunoglobulin	59	17	76
TOTAL	91	28	119

$\chi^2_c := 1{,}37$

Table 4

Results obtained with toxoid therapy

	Cured	Deceased	Total
No toxoid	22	5	27
Plain toxoid	24	6	30
Adsorbed toxoid	42	25	67
Total	88	36	124

$\chi^2 = 4{,}32$

Table 5

Results obtained with no serum therapy nor toxoid with heterologous serum and toxoid and with human antitetanus immunoglobulin and toxoid

	Cured	Deceased	Total
No serum therapy nor toxoid	22	5	27
Heterologous serum therapy and toxoid	33	11	44
Human anti-tetanus immunoglobulin and toxoid	33	12	45
TOTAL	88	28	116

$\chi^2 := 0{,}62$

Overall mortality in our patients was 28,4 per cent. The lethality rate in the 53 patients treated by us in the last 2 years was 20,8 per cent which does not differ significantly from the overall mortality ($\chi^2=1,4$).However, the latter percentage could, at first suggest that the lethality rate would fall. This could apply to the percentages shown by the above mentioned authors. We could still add that in 1975, 32 cases of tetanus were treated with a mortality of 9,4 per cent. Statistical interpretation must be cautious. Amongst other factors, the size of the samples cannot be neglected in such circunstances, as clearly demonstrated in the examples.

A revision of the literature clearly shows that there is a shift of the incidence of tetanus towards the older age groups which results from obligatory vaccination in childhood and during active life.

In Portugal this shift is also a fact, but not so pronounced as in other countries. We believe this to be true for two reasons: first because obligatory vaccination was only established for certain professional activities and for students in 1962 and 1963 respectively and second because the population after the first inoculation does not complete the whole schedule of immunization, perhaps because of misingterpretation of the law. This allows the acceptance of certificates, which may be issued as soon as the inoculation is initiated.

For this reason, of the 787.362 first inoculations in 1977, only 604.957 people received the second inoculation and, although 531.513 received the first two inoculations in 1976, only 284.673 of the 728.919 who initiated their vaccination that year, received the whole schedule of toxoid injections.

Table 6

Number of inoculations in Portugal 1976-1977

	1st-Inoculation	2nd-Inoculation	3rd-Inoculation
1976	728.919	531.513	233.556
1977	787.362	604.957	284.673

The mean age of our cases was 53 years, and 113 of our patients (37,8 per cent) were aged 60 or over. Of the 53 cases treated in the last 2 years, 27 were aged 60 or over which represents 50,9 per cent.

In table 7, we have divided the 113 patients into different age groups and respective lethality rate.

Table 7

Incidence and lethality of tetanus in 113 patients

Age (Years)	60-64	65-69	70-74	75-79	≥ 80	Total
Cured	24	26	16	3	2	71
Deceased	10	11	11	6	4	42
TOTAL	34	37	27	9	6	113
Lethality (per cent)	29,4	29,7	40,7	66,7		37,2

As can be seen, it is not the patients whose ages range between 60 and 70 who make the lethality rate rise. Though this age group is getting bigger it will not be easy to reduce the lethality rate because chronic disease, cardiovascular or pulmonary disorders and/or weakened organic defenses expose the patients of this particular age group to the complications of tetanus and/or intensive care management.

It is obvious that over the age of 70 mortality rises significantly.

The results obtained by Lopes et al,[3] Goulon et al [9] and Gautier et al [6] lead us to the same conclusion.

Table 8

Lethality of tetanus according to different authors in patients aged over 60

	Number of patients	Number of deceased	Lethality per cent
Goulon	134	44	32,8
M. Lopes et al	17	7	41,2
Gautier et al	157	91	57,9
Carrington da Costa et al	113	42	37,2

For all these reasons and with the therapeutical means we have nowadays, it does not seem likely that mortality will drop significantly.

It must be stressed that this statement has nothing in common with the one made by Bisht [10] who, based on large samples, states that not even treatment in intensive care units lowers mortality.

Our belief, together with the knowledge of the high cost of treatmnet in intensive therapy units, is another reason, let alone any stronger ones, to insist on the need of a correct active immunization that will put an end to a disease that should only exist in extremely rare situations like loss of immunity or impossibility of acquiring it.

RESUMO

A letalidade do tétano em Portugal é de 55 %, sendo declarados cerca de 165 casos por ano.

Na última década, 1968-77, foram tratados 299 doentes no Serviço de Reanimação dos Hospitais da Universidade de Coimbra. A letalidade foi de 28,4 %. No entanto, a letalidade registada em 53 doentes internados nos dois últimos anos foi de 20,8 %. Não houve redução significativa da letalidade ($\chi^2 = 1,4$).

Também na nossa amostra houve um desvio etário no sentido das idades mais avançadas. Dos 299 tétanos, 113 tinham 60 anos ou mais (37,7 %). As letalidades registadas neste último subgrupo foram:

60-69 ..... 71 casos 29,6 %
70-74 ..... 27 casos 40,7 %
$\geq$ 75 ..... 15 casos 66,7 %

Dos 53 tétanos tratados nos últimos dois anos, 27 tinham mais de 60 anos (50,9 %). O conjunto dos doentes com idade compreendida entre 60 e 69 anos não alteram a letalidade global. Essa letalidade é, na verdade, aumentada quando se consideram idades iguais ou superiores a 70 anos.

O acréscimo progressivo de doentes com mais de 60 anos, idade em que aparecem associadas quase invariavelmente doenças crónicas, mau estado cardiovascular e broncopulmonar, defesas diminuídas, etc., favorece o aparecimento das graves complicações próprias da doença bem como daquelas que advêm das técnicas de reanimação.

Assim, pensamos que não haverá redução da letalidade enquanto se mantiverem os actuais esquemas terapêuticos da doença.

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