

Commentary on “Syphilis in the Navy”

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Original article

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Year by year each Naval medical officer receives a copy of the Blue Book, the “Statistical Report of the Health of the Navy.” It is an interesting and useful study to compare these statistics connected with the various diseases over a period of years, with a view to ascertain what progress has been made either in diminishing the incidence of certain diseases, or in diminishing the time lost to the Service by each entry of these diseases. These Statistical Reports give the result of our endeavours in combating disease, and the study of them shows how these endeavours are proceeding. The work of the Naval medical officer is judged as regards disease by two facts: the number of cases of disease which occur, and the number of days which the Service loses by sickness arising from disease. The former concerns the preventive treatment of disease, the latter the treatment after the disease has been contracted.

For the purpose of this paper, syphilis has been taken as the disease for investigation. In the “Health of the Navy” there appears the following criticism as regards syphilis: “This reduction in the time lost to the Service chiefly attributable to the use of salvarsan as a treatment is not so great as was anticipated, especially with regard to the days sickness in hospital.” This is a striking paragraph to those who are interested in the treatment of syphilis in the Navy, and one which calls for investigation to discover the causes which give rise to evidently disappointing results. It is hoped in this paper to endeavour to trace and investigate some of these causes, and also to indicate modern lines of treatment which will be of help in bringing about an improvement in the statistical returns. A study of the statistics of syphilis since 1905 is instructive. Since 1905 an attempt has been made to differentiate chancroid from chancres or primary

syphilis, but this differentiation can only be approximately correct owing to the difficulties of diagnosis before modern methods were applied.

The following statistics are of use for our present purposes:

- (1) The prevalence of syphilis in the Navy as judged by the number of admissions per 1,000.*
- (2) The effect of syphilis on the invaliding and death rate.*
- (3) The loss to the Service in days by each case of syphilis.*

Year	Admissions
1905	48.9
1906	43.0
1907	46.5
1908	37.4
1909	37.5
1910	34.2
1911	30.8
1912	28.9
1913	22.4

Table 1. The rate per 1,000 of admissions from 1905 to 1913.

Table 1 shows that there has been a steady decrease in the number of cases admitted. This decrease is attributable to a number of causes, chief of which is the wave of sobriety which has been, and is, an increasing factor in the life of the modern sailor, as well as to an improved general moral tone. The improvement in treatment that has taken place since the advent of mercurial cream injections has also been an important factor in lessening the number of cases of relapse.

Year	Invaliding	Death
1905	1.3	0.02
1906	1.59	0.03
1907	1.49	0.05
1908	0.81	0.05
1909	0.94	0.06
1910	07	0.05
1911	0.52	0.02
1912	0.69	0.03
1913	0.4	0.01

Table 2. The rate per 1,000 of invalidings and deaths from 1905 to 1913

There has been a steady decrease in the number of cases invalidated, as would be expected with a gradual declining incidence. The death rate has varied from year to year, but it is satisfactory to find that in the past three years there has been a distinct tendency to a fall. The result of consideration of these statistics undoubtedly shows that there has been a most marked decrease in the number of cases of syphilis in the Navy, and this is most satisfactory. It is when we consider the next series of statistics that we are faced with the meaning of the criticism from the 'Health of the Navy' already quoted.

Year	Number of days
1905	31.7
1906	32.5
1907	33.7
1908	33.8
1909	33.3
1910	33.8
1911	33.5
1912	30.9
1913	31.9

Table 3. The number of days lost to the service per case of syphilis

Table 3 shows that, whilst a satisfactory decline in the number of cases of syphilis is taking place, no marked progress has been made in diminishing the number of days lost per case in sickness. This is surprising, for since 1911 salvarsan treatment has been applied in general use in hospitals, and yet little practical benefit has been shown by the statistics in the lessening of the days sickness. In this same period there can be no doubt that benefit has been obtained in diminishing the numbers of cases admitted for

relapse. In spite, then, of having at our disposal all the modern methods of treatment, the Service is not deriving the benefit that would be expected. As to the beneficial results of salvarsan and neo-salvarsan treatment there can be no doubt. It remains to be seen whether we are making full use of these valuable drugs.

In 'Health of the Navy' (1912), it is reported that "cases include 715 primary syphilis and 2,744 cases secondary syphilis." These cases of secondary syphilis may be presumed to consist of (a) undiagnosed or inadequately treated cases of syphilis which have passed the primary stage and reached the secondary stage; or (b) cases of relapse. Experience indicates that the total figures will consist chiefly of cases that have not been diagnosed and adequately treated until secondary symptoms have developed. We are dealing then with a disease which we know must, before reaching the secondary stage, pass through a primary stage. This primary stage can, in the majority of cases, be easily diagnosed by modern clinical and bacteriological methods. Yet statistics show that practically only one case out of five is diagnosed and treated before reaching the secondary stage.

It is known that the maximal results are obtained from salvarsan by its use in the earliest stages of the disease. The earlier in the disease it is administered the greater the chance of a rapid cure, the better the prospect of lessening the infectious stage, and also the smaller the chance of relapse. It is evident from the statistics that the period, the early primary stage, at which the maximal benefit by salvarsan treatment should be obtained, has been allowed to slip by, and it is not until a general infection with complicating secondary symptoms has supervened that we are in a position to make use of a valuable treatment. If our treatment of syphilis were satisfactory the ratio of primary syphilis to secondary syphilis would be nearer 4 to 1 than as at present 1 to 4. The reason why these cases are not treated is that they are not diagnosed early enough, and this is the main key to the problem as to why the Service is not obtaining the maximal benefit which salvarsan treatment offers. It behoves us to diagnose the cases as early as possible in order to administer salvarsan treatment as early as possible. The time should be near when a diagnosis of secondary syphilis will indicate carelessness on the part of the patient in not reporting his disease, or on the part of the medical officer for his failure in diagnosis.

Having stated that the earliest possible diagnosis of syphilis is of the utmost importance, it may be useful to survey the methods of diagnosing the nature of a sore, for with present knowledge this is the earliest tangible sign presented:

- (1) Clinical
- (2) Microscopic: (i) dark ground illumination; (ii) Burri's Indian ink; (iii) staining.

The clinical examination is often of great value, but is fallible, and experience leads one to look on the microscopic methods as the most useful, and absolutely necessary. There are three common microscopic methods, but the easiest and most important is the dark ground illumination, which is unfortunately at present not practicable for ordinary ship's use. Burri's Indian ink is supplied to the Navy, and, with a little practice, is very reliable and of special value for work in ships. The staining methods of demonstrating the Spirochaeta pallida are not very satisfactory for general use. Every case of sore of venereal origin should be examined by the means at our disposal, and if any doubt exists, the case should be sent to hospital for diagnosis. I have not included in the above the diagnostic value of the Wassermann reaction. It is not generally realised that it takes some time, sometimes weeks, before a positive Wassermann is obtained in early syphilis. It constantly happens that the bloods of cases of early syphilis are sent to the laboratory for diagnostic purposes, and a negative Wassermann is the frequent result. In consequence the case is assumed to be non-syphilitic, and no adequate treatment is given. Sooner or later a considerable number of these cases develop secondary signs. They are then sent into hospital for treatment, the case-sheet not omitting to state that this man had a Wassermann test done, and the result was returned as negative. The majority of these cases could have been diagnosed early if, instead of relying on the Wassermann test for an early diagnosis, the spirochaete test had been applied. Syphilis should be diagnosed at a stage when the spirochaete test is positive and the Wassermann negative.

The effect of previous treatment on diagnosis by examination for spirochaetes

For many years past it has been the custom in the Navy to treat practically every sore of venereal origin with black wash as soon as the man presented himself at the sick bay. The treatment is often excellent in its immediate effect; the sore heals and the man returns to duty. After a variable time, however, many of these men return with secondary signs, and are sent to hospital.

Cases are admitted to hospitals almost daily with the history: "This man had a sore on his penis a month ago. The sore was treated with lotio nigra, and is now healed. As he has developed secondary rash, he is sent to hospital for treatment." Lotio nigra has been applied before diagnosis has been made and this is a cause of much loss to the Service. Under the action of mercury the sore heals and the secondary symptoms are only delayed. Locally the spirochaetes are driven from the upper surface of the sore, and several days must elapse before it is possible to find them. Unless the case has been definitely diagnosed as syphilis, the use of lotio nigra is contraindicated. Cases of sore with bubo are constantly admitted to hospital, the sore

having been treated with black wash or other antiseptics without a definite diagnosis having been previously made. Owing to the action on the spirochaete, it is of little use examining these sores until several days of appropriate treatment have elapsed. The diagnosis is in consequence delayed resulting in a delay, in treatment, injurious alike to the Service and to the patient.

We may now consider the second part of the criticism in the 'Health of the Navy' already quoted. It has been shown that two impediments to the early diagnosis of syphilis are (1) the dependence of diagnosis on the Wassermann test, and (2) the indiscriminate use of antiseptics, especially lotio nigra, to sores before a diagnosis is made. These factors have a great influence on hospital statistics in that, instead of cases being admitted for treatment in the primary sore stage, they are not admitted until the later stages of the disease. In these cases, in addition to the primary symptoms, there are the symptoms of general infection, ulcerated throats, mouth, and nose, general adenitis, often complicated with suppurating buboes, condylomata requiring operation, eye symptoms, and all the other features of neglected syphilis, some of which require prolonged treatment. There are also a large number of days lost through the delay in the diagnosis.

The outlines of syphilitic treatment at the Royal Naval Hospital, Haslar

In the venereal wards there are two orders which are given to medical officers on joining:

(1) No antiseptic is to be applied to venereal sores until the nature of the sore has been determined and; (2) Every sore is to be examined as soon after admission as possible for the presence of S. pallida. Active treatment is delayed until the sore has been diagnosed chancre or chancroid. On admission the sores are treated with white lint soaked in saline solution, and the penis is protected by a bag made of impervious batiste. The sores are examined daily for spirochaetes. If S. pallida are found, treatment by neo-salvarsan is given as soon as possible. If no spirochaetes are found on the first day, examinations are carried out over a period of a week. If on four occasions in the week no spirochaetes are found, the diagnosis is made of chancroid, unless physical signs are suspicious. If the case has been previously treated with black wash, a period of three or four days under saline treatment is necessary before there is any hope of finding the spirochaete. Once the diagnosis has been made any treatment considered necessary is applied. At Haslar, the most satisfactory local applications have been found to be black wash, calomel, and sprays containing perchloride or biniodide of mercury. These sprays are found to be of great convenience and value in general syphilitic treatment, especially in condylomata and rupial ulceration. They are also of value in the treatment of bubo wounds after excision. Fuchsin ointment has

also been used with success, especially in treatment of chancroids. Excision of the sore is carried out if possible.

The administration of neo-salvarsan

When admitted for the first injection the patient goes to bed for two days, during which period his general condition is investigated, especially heart, lungs and urine. The evening previous to injection 1oz castor oil is given. On the day of injection (the third day) no food is given before, and for four hours after, injection. The injection is made intravenously into the arm. Maximal doses are given unless there are contraindications. Cases of reaction with pyrexia, headache, vomiting, with rash, or increasing intensity of rash occur, but these cases are almost always found to be in the late primary or early secondary stage of the disease. It is easy to judge after a little experience what cases will have a reaction. It is advisable to caution these patients beforehand, for then they are not frightened when the temperature rises and a short uncomfortable period occurs. After injection the patient is put to bed, where he remains for three days. I think this period before and after injection errs on the cautious side, and its reduction would certainly improve the statistical results. The urine of all cases is examined for arsenic for three days after injection, and in every case, except one out of 1,100 injections, has been present. The case in which no arsenic could be demonstrated showed no ill effects. Mercury is given on the day after injection.

Patients admitted for the second and third injections are retained in hospital only for a period of two days if they have no active signs of syphilis, being kept in bed for the day before and after the injection, and discharged from hospital on the third day. When the patient is discharged to his ship a syphilis case-sheet accompanies him, detailing the treatment he has received. A note is made recommending continuous mercury treatment, which is best carried out by injection of mercurial cream. The men are also advised to have a Wassermann blood test every three months.

The usual routine is to give each case two maximal doses of neo-salvarsan at an interval of a month, and the after treatment depends on the result of the Wassermann test and the progress of the disease. The period of treatment depends on the case. If neo-salvarsan is injected early in the disease results indicate that, in the majority of cases, a complete cure can be brought about by the two injections with a short course of mercury lasting three months. Probably the mercury is not necessary at all in these cases. In the late stages, when the Wassermann has become positive, it is advised that the mercury be persisted in for two years, or until the Wassermann has been negative over a period of nine months. In the latter case a further three months is allowed to elapse without mercury and the Wassermann again tested. If the Wassermann still gives a

negative result the disease is probably cured. The evidence that this treatment is satisfactory is borne out by the small number of relapse cases that occur. It remains to be proved by time whether a cure is absolute or only temporary.

I am afraid that this paper has nothing new to offer as to the treatment of syphilis, but it is written as the result of experience gained in the venereal wards at Haslar, with a view that it may be of some use to the Service and may help to bring about the greatly desired decrease in the total days' sickness from this disease.

Commentary

Sexual transmission of the spirochaete *Treponema pallidum*, which causes syphilis, had a significant effect on the Royal Navy both before and throughout World War One (WW1). This infection caused considerable numbers of days lost to service with lengthy hospitalisations for treatment, despite efforts to reduce transmission by public health campaigns aimed at improving 'moral behaviour' as shown in figure 1 by the US (United States) Navy. The subsequent morbidity and mortality from syphilis itself and from the harsh treatments of arsenic or mercury compounds that were in use at the time followed.

Although the Royal Naval Hospital Haslar had been given access to the arsenical salvarsan since around 1911, there was disappointment and criticism of this treatment reported in the official report 'Statistical Report of the Health of the Navy, 1912' when it was realised that there was no significant impact on the 'time lost to service'.

It is interesting that the article states how easy the primary stage of syphilis is to diagnose, yet diagnoses in the early stage were still being missed. The author outlined the management protocol used at Haslar for any venereal sore, aimed at educating clinicians to ensure that syphilis was at the forefront of the differential diagnosis list and could be more readily recognised and treated promptly in the early stages. This is very different to today where all stages are often missed by both patients and clinicians. An article written by Colonel Harrison RAMC at the start of WW1 also noted that education of both troops and clinicians was vital in order to increase the rate of detected primary lesions (1, 2).

Dudding described some of the symptoms of secondary syphilis which are still seen in clinical practice today but are often mistaken for other diagnoses (3). Features such as lymphadenopathy, oral lesions, rashes (especially on the palms and soles), wart-like anal lesions, hepatitis, glomerulonephritis, patchy alopecia, fevers and weight loss have given syphilis its reputation as 'The Great Mimicker'.

Investigations using serology have disappointingly not

progressed significantly, with the Wassermann reaction (developed in 1905) still forming the basis of the serological testing in use today. There is now a Deoxyribonucleic Acid (DNA) test that can be utilised from an active ulcer site but this is not widely available yet and still requires the clinician to think of the diagnosis in the first instance. We face the same consequences as Dudding witnessed when the missed primary chancre or syphilitic 'sore' healed spontaneously, only to progress to secondary and later stages of syphilis if the causative organism was not recognised and treated.

Surprisingly, the treatment of syphilis has actually remained the same since 1940 when penicillin was first used in clinical practice (4). Although there have not been the same problems with resistant organisms as with other bacteria such as *Neisseria gonorrhoeae*, the latest national figures still report the diagnoses of syphilis in England increasing by 61% among men from 2003-2012 along with a rise in the new diagnoses of sexually transmitted infections (5, 6). With prevalence rates and late diagnoses of Human Immunodeficiency Virus (HIV) infection also increasing, it remains as important as ever for service personnel and clinicians to be ever vigilant for the diagnosis of syphilis and other sexually transmitted infections, with the emphasis on early diagnosis and prompt, effective treatment. This not only maintains the operational effectiveness of our service personnel but also provides the best possible care and limits entirely preventable clinical sequelae and transmission to others.

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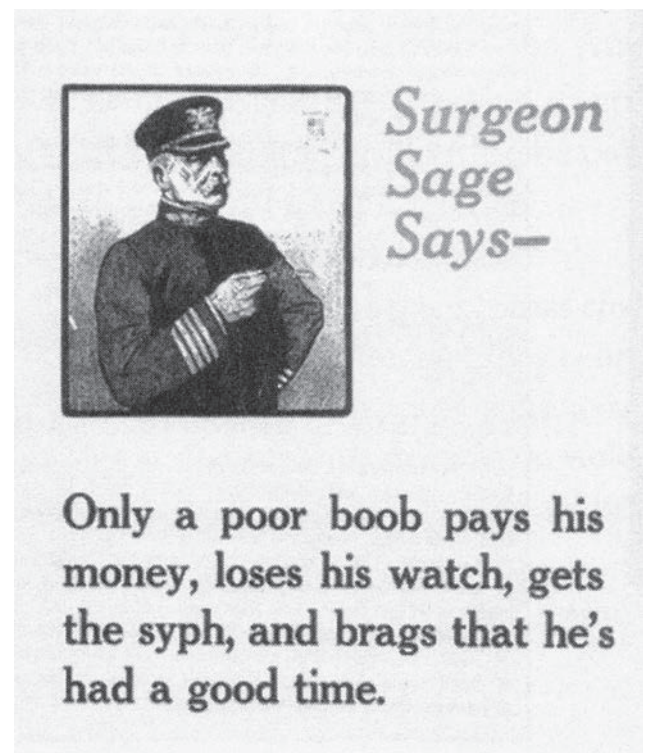


Figure 1: US Navy public health poster from WWI. Used with permission from US National Library of Medicine.