The conflict of Osler's concept of "typhoid spine"

Thomas G. Benedek MD

See related article, "Typhoid spine," by William Osler, available at www.cmaj.ca/100/pdfs/typhoid_spine.pdf

The Canadian clinician William Osler (1849–1919) wrote the article on "typhoid spine" during the last year of his life while Regius Professor of Medicine at Oxford University.¹ This commentary looks at Osler's view of the psychogenic cause of typhoid spine.

Typhoid was a common disease in the late 19th century. According to Osler, a patient who survived typhoid was usually ill for about six weeks, and a conservative estimate of mortality was 12%–15%.² Official reports for 1906–1910 state that of the 51 American cities with a population of more than 100 000, only Cambridge, Massachusetts, did not have an annual mortality from typhoid of more than 10 per 100 000. The mortality rate exceeded 55 per 100 000 in Pittsburgh, Pennsylvania, Atlanta, Georgia, and Louisville, Kentucky.³

Virgil P. Gibney (1847–1927), an orthopedic surgeon from New York, introduced the term "typhoid spine" in 1889 for a syndrome that may develop during the convalescent phase of typhoid.⁴ The syndrome was predominated by pain and limited mobility of the back. Gibney attributed these symptoms to "perispondylitis, meaning an acute inflammation of the periosteum and the fibrous structures which hold the spinal column together." It was thought to be rare because many patients died of acute typhoid before the symptoms of the back could develop. The most recent review on typhoid spine was published in 1998.⁵

In 1886, the London neurologist William R. Gowers (1845–1915) described the symptoms that would come to be called typhoid spine:

Paraplegic weakness is not uncommon, and also occurs usually when the disease is on the decline. ... The onset may be attended by spinal tenderness, and with hyperesthesia or various subjective sensations in the legs, and these may be followed by defect of sensation. It is probable that the symptoms are due to a myelitis (inflammation of the spinal cord) of slight intensity. They usually pass away in a few weeks ...⁶

The first comment on the possible psychogenic cause of the syndrome has been attributed to Abraham Jacobi (1830–1919) in a statement made during the 1890 meeting of the

Association of American Physicians. Osler quoted Jacobi as having said that typhoid spine could be "either a neurosis or a spondylitis."⁷

In 1919, Osler remembered having first seen a similar syndrome in 1887, and that the patient "... was so nervous that I regarded the whole condition as functional ... and gave a favourable prognosis."¹ In the first (1892) edition of his textbook, Osler described the syndrome as "spinal neurasthenia":

[T]he patients complain of weariness on the least exertion, of weakness, pain in the back, and of aching pains in the legs. There may be spots of local tenderness on the spine. Occasionally there may be disturbances of sensation, particularly a feeling of numbness and tingling, and the reflexes may be increased. The aching pain in the back or in the back of the neck is the most constant complaint in these cases. In women it is often impossible to say whether this condition is one of neurasthenia or hysteria.⁷

In 1894, Osler was prompted to discuss Gibney's findings based on four patients for whom Osler had provided care during the previous two years.⁸ He thought that Gibney had erred in attributing the same pathogenesis to all four patients, since Osler had not ruled out attributing some symptoms to perispondylitis. Osler's principal arguments against an organic explanation for the syndrome were the lack of purulent lesions, the development of symptoms during convalescence, his interpretation of the patients' responses to pain and the frequency of paresthesias. Osler wrote:

The general impression given by the patients whom I saw was that they were neurasthenic, and while, of course, it would be very illogical to assume that all of

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Correspondence to: Dr. Thomas G. Benedek, benedek@pitt.edu

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YEARS OF MEDICAL KNOWLEDGE

KEY POINTS

- In the late 19th century, symptoms that were inconsistent with those of a specific disease were thought of as due to neurasthenia.
- William Osler's articles on typhoid spondylitis, a rare complication of a then-common disease, show how difficult it may be for a clinician to discard a concept despite evidence.
- The symptoms of typhoid spine are due to either osteomyelitis of a vertebra or, in instances of paraplegia, a paravertebral abscess.

the instances were due to the same cause, yet I can not help feeling that many of them are examples simply of a painful neurosis, an exaggerated condition of what was formerly known as “spinal irritation” ...⁸

He did not, however, allege that pain attributed to typhoidal neuritis, another uncommon, late manifestation of typhoid, was neurasthenic.⁹

Osler’s associate, Thomas McCrae (1870–1935), wrote that the first two radiographic investigations of typhoid spine were made in 1904 (six months after the onset of typhoid) and 1905 (two months after the onset of typhoid).¹⁰ Both radiographs showed ossification between the lumbar vertebrae. These findings were thought to be organic abnormalities resulting from typhoid. Nevertheless, McCrae wrote the following:

[N]eurotic features are present in many of the cases and may be most marked. They may come on with surprising rapidity, so that soon after the onset of symptoms the patient becomes hysterical, loses all control over his inhibition, and is transformed into a whining, complaining individual with whom it is difficult to have patience. A similar state is often found in spondylitis associated with other diseases, such as spondylitis deformans (ankylosing spondylitis).¹⁰

Such comments are absent from the writings on orthopedic medicine by McCrae’s contemporaries and appear to reflect more poorly on the distinguished author than on his patients.

Joel Goldthwait (1866–1961), an orthopedic surgeon from Boston, thought that the pain in ankylosing spondylitis was the result of “hyperemia which surrounds any irritative or inflammatory process,” rather than the result of newly formed bones placing pressure on nerves.¹¹

In 1907, Osler and McCrae conceded:

There is much difference of opinion as to the nature of this condition, whether functional or due to organic changes. ... The most convincing evidence of organic change is given by the radiograms. The proof of bony changes in certain cases suggests that organic conditions of some sort are probably present in many. In some patients the hysterical features are so marked and the evidences of any organic changes so slight that a functional disturbance is suggested.¹²

Osler and McCrae subsequently suggested that there were three categories of typhoid spine: hysterical features predominating without detectable organic changes; periostitis or perispondylitis with evidence of nerve root involvement; and a combination of the first two categories.

Like Gibney, L.W. Ely thought “that a neuritis was caused by inflammation of the bone and of the periosteum, and that one or more of the spinal articulations were involved.”¹³ According

to Ely, “The only writer of note who takes an entirely different stand, based on cases he has observed, is Osler, who thinks it is a neurosis.”¹³ Ely was not quite accurate; in the 1898 textbook *The Practice of Medicine*, James Tyson (1841–1919) considered that typhoid spine “may be a spondylitis, but is probably a pure neurosis.”¹⁴

G.B. Packard concluded that the response to bracing that he saw in five of his patients proved that their conditions were not the manifestations of neuroses:

There is nothing so unsatisfactory ... as trying to relieve neurotic symptoms by fixation. ... The pronounced relief from fixation in typhoid spine ... presents the strongest possible evidence ... that this group of symptoms known as typhoid spine is not a neurosis.¹⁵

The hypothesis on which the diagnosis of neurasthenia was based was that everyone has a finite amount of “nervous energy,” which is a heritable characteristic of the nervous system. Symptoms may develop when life stresses cause the supply of nervous energy to be exhausted. A person with a congenital deficiency of this energy is particularly susceptible to neurasthenic symptoms during minor stresses. According to Osler, the diagnosis covered “a motley group of symptoms” that could either affect the entire body or be limited to certain organs. “In certain aspects it is the physical counterpart of insanity. ... It may follow the infectious diseases, particularly influenza, typhoid fever and syphilis.”¹⁶

Osler included a section on neurasthenia in each edition of his textbook. His description of neurasthenia was similar to that of typhoid spine when spinal symptoms predominated. In his 1919 article published in the *CMAJ*, Osler admitted “... to have taken too one-sided a view of the condition,” which he then justified. In the 1920 edition of *Principles and Practice*, the comment about hysterical women was deleted, and the behavioural aspects of typhoid spine were reduced to “Stiffness of the back, pain on movement, sometimes radiating, and pain on pressure are the chief features, but there are in addition marked nervous manifestations.”¹⁷

An editorial on typhoid spine published in the *Journal of the American Medical Association* in 1907 recommended that “the practitioner should regard the condition as organic and regulate his treatment accordingly, unless the evidence of the neurotic nature of a given case is overwhelming.”¹⁸

This fragment of Osler’s extraordinarily distinguished career illustrates the difficulty that even the most knowledgeable clinician has in rejecting dogma. Although he acknowledged the specific

bacterial cause of typhoid,¹⁹ Osler was reluctant to relinquish the diagnosis of neurasthenia.

Typhoidal spondylitis is considered a rare disease that usually occurs in people who are medically or nutritionally compromised. It results from the dissemination of various species of *Salmonella* bacteria through the blood stream. Septic arthritis is the most frequent result of this septicemia, but osteomyelitis, usually of the tibia or femur, and paravertebral abscesses have also been reported.^{20,21}

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Affiliation: Thomas Benedek is Professor of Medicine, Emeritus, Division of Rheumatology, Department of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pa.

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