

Enduring beliefs about effects of gassing in war: qualitative study

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BMJ 2007;335:1313-15

doi:10.1136/bmj.39420.533461.25

ABSTRACT

Objectives To discover the content of enduring beliefs held by first world war veterans about their experience of having been gassed.

Design Collection and thematic analysis of written and reported statements from a sample of veterans about gassing.

Subjects 103 veterans with a war pension.

Results Twelve themes were identified, which were related to individual statements. The systemic nature of chemical weapons played a key part in ideas and beliefs about their capacity to cause enduring harm to health. Unlike shrapnel or a bullet that had a defined physical presence, gas had unseen effects within the body, while its capacity to cause damage was apparent from vesicant effects to skin and eyes. The terror inspired by chemical weapons also served to maintain memories of being gassed, while anti-gas measures were themselves disconcerting or a source of discomfort.

Conclusions Chronic symptoms and work difficulties maintained beliefs about the potency of chemical weapons. In the period after the war, gas continued to inspire popular revulsion and was associated with a sense of unfairness.

INTRODUCTION

The use of gas has been described as an "atrocious method of warfare"¹ and has had long term consequences on exposed servicemen. Recent studies of troops in training or civilians attacked by terrorists have shown that chemical weapons have retained their capacity to frighten. Although realistic exercises

may do much to encourage habituation, for some such drills are in themselves traumatic. Three studies of US troops on courses on chemical and biological weapons found that 10-20% experienced moderate to severe psychological symptoms.² Because civilians often share the fears of their military counterparts, chemical weapons appeal to terrorists and others engaged in asymmetric warfare.³ The release of a small quantity of sarin gas in the Tokyo subway system in 1995 by a terrorist organisation killed 12 people but led to the emergency rooms of local hospitals being swamped by over 5500 people, of whom fewer than 20% were deemed to have experienced any identifiable physical effect.⁴

During the first world war, fears associated with chemical weapons were disproportionate to their killing power. Augustin Prentiss of the American Chemical Warfare Service estimated that only 4.3% of US gas casualties died compared with 24% of other types of battlefield injury.⁵ While there are few long term studies of the physical effects of gas, those that exist suggest that their capacity to cause harm may have been overstated.⁶ In the US, a major government funded study examined 838 servicemen exposed to chlorine and 1016 exposed to mustard gas and concluded that gassed veterans were at an increased risk of chronic bronchitis, though they were unable to control for confounders such as smoking, industrial pollution, and poor quality living conditions.⁷ An investigation of 111 UK veterans who had volunteered to take part in chemical agent trials at Porton Down in the 1950s found no evidence of any long term adverse effects on health or unusual patterns of disease.⁸

Using records from the first world war we explored the ideas and beliefs held by servicemen exposed to gas but not seriously incapacitated.

METHOD

The 7800 first world war files held by the War Pensions Agency provided a sample of veterans who had been exposed to gas. The records relate to all diagnoses. While not necessarily representative of all gassed people, the records provided an extended period of assessment and included death certificates. Regular medical boards held over periods of up to 60 years enabled us to gather a wide range of statements about perceptions of gas and its effects. We extracted a random sample of 103 files.

We excluded veterans with severe respiratory illness to focus on those whose ideas and beliefs were not grounded in objective pathology. We included pensioners who had occasional or mild episodes of



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What happened next?

bronchitis. Data on mortality confirmed the essential healthiness of the sample as they had a mean age of 82 (range 54-102).

When applying for a pension or presenting to a medical board, veterans were examined by a panel of civilian doctors. Veterans referred for a specialist opinion had an opportunity to say what they believed was wrong with them. Statements survived for 60 subjects; no reports could be found for 43. Most of these accounts (61%) relate to the period November 1918 to December 1924, and 95% were reported between the end of the war and June 1949. We collected data as free text, which was analysed thematically by using the constant comparative method.⁹ Claims were verified by reference to military medical cards and hospital records.

RESULTS

We identified 228 statements from the 60 veterans for whom we had data. The length and number of their statements varied; some wrote lengthy documents while others submitted single line responses.

Three themes were repeatedly expressed by different individuals or by the same person on several occasions: that the person had an enduring illness (expressed by 58% of those who recorded statements), that continuing ill health had been caused by gas (55%), and that effects of gas poisoning were so severe as to lead to a considerable loss of time from work (57%). Allied to these core themes were three associated beliefs: that chest and lungs had been damaged (38%), that their health was deteriorating (32%), and that a medical intervention was needed (20%).

These themes can be illustrated by the following statements: "I have been getting gradually worse every year . . . Also that my system is full of gas" (March 1930). "I have now come to the conclusion that instead of the effects of gas wearing off as hoped, it has gradually overpowered me" (January 1927). "I honestly feel done up and not half the man I should be . . . I have to lose time at work" (May 1923). "I am often ill and cannot always get my breath, and am sure it is by being gassed" (April 1924). The potency of gas was also revealed: "a stuffy feeling in the chest and a feeling of suffocation" (May 1926), "have suffered from loss of voice on several occasions, which I am of the opinion was caused by being

gassed on active service" (March 1924).

Associated with these themes were beliefs that the person needed to breathe fresh air as much as possible (four cases) and could undertake only light manual labour (eight cases). Surprisingly, the psychological consequences of being gassed were scarcely mentioned, "nerves" and depression being recorded by only three veterans. That these were genuine beliefs is supported by consistency of reporting.

In general, this group of veterans believed that the effects of chemical weapons were irreversible, potent, and debilitating. These conceptions stood in contrast with the objective measures of health recorded for individuals in the sample.

DISCUSSION

Traumatic memory

The statements themselves offer clues as to why gas was so frightening and had such a lasting effect on men's minds. Unlike a bullet or piece of shrapnel, which could lodge in the body and be removed surgically, gas was systemic. A toxin could be drawn deep into the lungs and spread through the viscera, akin to a pathogen from a plague.¹⁰ The visible damage caused by mustard gas to the skin and eyes offered tangible evidence of what a poison could do inside the body. The chemical agent had no definite physical limits and no operation could remove it.

During the war itself, gas was one of the most feared weapons. It inspired emotion out of all proportion to its ability to kill or wound. In part, this related to surprise deliberately exploited by combatants. With the introduction of the gas shell in February 1916, a toxin could be delivered anywhere within artillery range. Habituation and the adoption of coping strategies were hampered by continual refinements in chemical weapon technology. Knowledge, even among the medical corps, remained perfunctory.

Some anti-gas devices, in particular the respirator, led to limited vision and made breathing a conscious effort.¹¹

Beliefs and symptoms

Recent studies of US veterans exposed to the threat of chemical weapons have shown that both symptoms

WHAT IS ALREADY KNOWN ON THIS TOPIC

Chemical weapons exercise considerable psychological effects beyond their capacity to kill and wound. Those exposed to chemical weapons, or even the threat of them, often experience chronic adverse health effects.

WHAT THIS STUDY ADDS

The systemic nature of chemical weapons plays a crucial part in establishing ideas about their potency and long term consequences.

The powerful emotions attached to the exposure itself inspire strong beliefs that frame interpretations of subsequent ill health.

and the memory of alerts in war zones are important in establishing and maintaining beliefs about being poisoned. In 2006, it was reported that 64% of a sample of 335 US veterans of the Gulf war believed that they had been subjected to chemical weapons compared with 6% of 269 service controls who had not deployed to the conflict.¹²

All of the veterans in our study experienced enduring symptoms.¹³ These were in general somatic and mostly focused on the respiratory and cardiovascular systems. Acute respiratory infection immediately after the war tended to be framed in terms of exposure to gas and regarded as further evidence of its long term effects.

CONCLUSIONS

We conclude that there was an interaction between ex-servicemen's symptoms and beliefs, which began with the traumatic experience of being gassed but was also linked to popular convictions about its potency and systemic effects. The conviction of

having been gassed had long term deleterious effects on a person's beliefs about illness and perceptions of health and wellbeing. Our analysis might assist in understanding the otherwise baffling persistence of ill health experienced by some US and UK military personnel after their deployment to the 1991 Gulf war.

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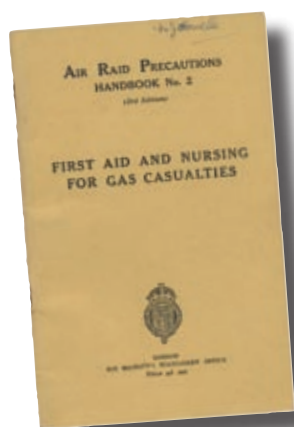
Funding: Economic and Social Research Council and the Ministry of Defence (RES-000-23-1057).

Competing interests: None declared.

Ethical approval: South London and Maudsley ethics committee.

Provenance and peer review: Not commissioned; externally peer reviewed.

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Observe cases minutely, improve in my profession, write to the "Lancet"

So wrote Arthur Conan Doyle to his mother on qualifying in medicine from the University of Edinburgh in 1881. But the creator of Sherlock Holmes had already published a letter in the *BMJ* while a medical student.¹

In his third year, he worked as a dispensing assistant to Reginald Hoare, a general practitioner in Aston. Conan Doyle had developed symptoms of persistent neuralgia and taken tincture of *Gelsemium sempervirens*, the dried rhizome and root of yellow jasmine. Its effects resemble those of nicotine, but with stronger depression of the central nervous system.

He increased the dose incrementally from 40 minims (2 ml) on the first day to 200 minims (10 ml) by the seventh. Conan Doyle reported his resulting symptoms; initial "giddiness," difficult eye accommodation, headaches, and diarrhoea with severe depression on the final day. Although his *BMJ* letter describes the drug's side effects, he must have known that deaths from respiratory arrest had been reported with *Gelsemium*.

Self experimentation reappears in his MD thesis on vasomotor changes in tabes dorsalis.² Conan Doyle described experimenting with nitroglycerine as a vasodilator before using it on his first patient. "The dose beginning with one drop may be safely increased to twenty, a congestive headache being the first sign of overdose. I have myself taken as many as forty minims without inconvenience."

Conan Doyle wasn't the only self experimenting doctor in the 19th

century. In the 1880s Sigmund Freud brought the effects of cocaine to the attention of the medical world but not before sampling them himself: "In my last severe depression I took 'coca' again and a small dose lifted me to the heights," he wrote to his fiancée.³

Freud abandoned his interest in cocaine just as his colleague Karl Koller began experimenting with its use as an anaesthetic in eye surgery. Conan Doyle visited the ophthalmology department at Vienna Hospital in 1891 and became aware of the toxicity of cocaine.

But what of the fictional Sherlock Holmes, who became addicted to cocaine? Did his addiction begin in the same spirit of self experimentation shown by his creator's explorations of *Gelsemium* and nitroglycerine? In the *Sign of Four*, Dr Watson admonishes Holmes for his cocaine addiction: "Count the cost! It is a pathological and morbid process, which involves increased tissue change and may at least leave a permanent weakness."

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Competing interests: None declared.

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