

J. D. Johnston

Mary Broadfoot Walker (1888–1974)



Portrait of Dr. Mary Walker circa 1950

Mary Broadfoot Walker was born and brought up in Wigtown, Scotland. She was one of four children, the daughter of a Judge. Mary Walker graduated in 1913 with MB ChB from Glasgow & Edinburgh Medical College for Women (women were trained separately from men at this time following a decree by the General Medical Council in 1874 ‘so as to preserve public order’). She served for the Royal Army Medical Corps in Malta and Greece during World War I and then returned to England to take up post in 1920 as a salaried Assistant Medical Officer in ‘Poor Law Service’ at St. Alfege’s Hospital, Greenwich.

In 1934, whilst still a Medical Officer at St. Alfege’s Hospital, Dr. Mary Walker discovered that a subcutaneous injection of physostigmine could (temporarily) restore muscle function in a patient with myasthenia gravis. Physostigmine was used at that time as an antidote for curare poisoning. Dr. Walker had thought that the signs and symptoms of myasthenia gravis resembled curare poisoning and that myasthenia gravis might be caused by a circulating curare-like substance – if this were so then the signs and symptoms of myasthenia gravis would be alleviated by physostigmine [1, 2]. The first case of myasthenia gravis to be successfully treated with physostigmine

was ‘Mrs. M.’ and the case report was published in the *Lancet* [3].

Dr. Walker worked in collaboration with Hoffman-LaRoche, Switzerland to search for an oral analogue of physostigmine that had less troublesome side-effects – Prostigmin (neostigmine) was chosen. ‘D. C.’, a 34-yr old chambermaid who had had myasthenia gravis for at least 6 years and who had been treated unsuccessfully at Middlesex Hospital, London with atropine and thymic irradiation, was referred to Dr. Walker in late 1934. ‘D. C.’ had profound muscle weakness and was unable to rise from the supine position. ‘D. C.’ was the first person to be given subcutaneous Prostigmin. Her symptoms temporarily reversed after each injection. In the following months, ‘D. C.’ remained at St. Alfege’s Hospital to help Dr. Walker find the dosage of oral Prostigmin needed to manage her symptoms. ‘D. C.’ was presented to the Clinical Section at the Royal Society of Medicine, London on 8th February 1935 and the case was later published in the Proceedings of the Royal Society of Medicine [4]. The effect of Prostigmin in restoring the muscle function of ‘D. C.’ was dramatic – so dramatic that not all believed what they had witnessed that day at the Royal Society of Medicine [1]. Muscle function was restored within minutes and the effects lasted about 6 hours. The side-ef-

Received: 3 April 2007
Received in revised form: 12 May 2007
Accepted: 30 May 2007

J. D. Johnston FRCPI (✉)
Medicines and Healthcare products
Regulatory Agency
Floor 11, Market Towers
1 Nine Elms Lane
London SW8 5NQ, UK
E-Mail: jdjohnston@doctors.org.uk

fects of Prostigmin were discussed at the Royal Society of Medicine but the main disadvantage seems to have been its cost – nine pence per ampoule (about four pence of modern currency) [4]. The dosage and schedule of oral Prostigmin administration devised by Dr. Mary Walker is still used today in selected cases of myasthenia gravis.

On 17th February 1938 Dr. Walker demonstrated what became known as ‘the Mary Walker effect’ to the Section of Neurology at the Royal Society of Medicine [5]. In summary: as the effect of Prostigmin on a patient with myasthenia gravis is about to wear off, the circulation in both arms is occluded by sphygmomanometer armbands at a pressure of 200 mmHg; both forearms are exercised until tired; the armbands are released and within 90 seconds the patient develops ptosis. Dr. Walker used this clinical sign to support her claim that myasthenia gravis was caused by a circulating curare-like substance that was produced by muscle activity [6].

Dr. Mary Walker was awarded Membership of the Royal College of Physicians in 1932 and obtained an MD in 1935 from Edinburgh University for her work on myasthenia gravis [7]. Her MD thesis was awarded the Gold Medal for 1935 and is now available to view by appointment at the Special Collections

Library of Edinburgh University, George Square, Edinburgh EH8 9LJ UK. Dr. Walker went on to outline the relationship between hypokalaemia and familial periodic paralysis [8] and was rewarded by the Royal College of Physicians of London in 1963 with the Jean Hunter Prize for her work in muscle disorders. (The Jean Hunter Prize has been more recently awarded to Professor John Newsom-Davis from Oxford. Professor Newsom-Davis has contributed much to the present-day understanding of myasthenia gravis.)

In recognition of her achievements, Dr. Walker was offered a senior appointment to Elizabeth Garrett Anderson Hospital in 1938 but her financial circumstances meant that she had to continue in a salaried post. The last years of Dr. Walker’s life were spent at her family home in Wigtown, Scotland from where she continued medical practice by working part-time at Glasgow Royal Maternity and Women’s Hospital. She maintained correspondence with many of the people she had treated for myasthenia gravis and published a leading editorial article on myasthenia gravis in the *British Medical Journal* shortly before she died [6]. Dr. Walker’s obituary and remembrances appeared in the *Lancet* [9, 10].

References

1. Keesey JC (1998) Contemporary Opinions about Mary Walker. A shy pioneer of therapeutic neurology. *Neurology* 51:1433–1439
2. Johnston JD (2005) The contribution of Dr. Mary Walker towards myasthenia gravis and periodic paralysis whilst working in poor law hospitals in London. *J Hist Neurosci* 14(2):121–137
3. Walker MB (1934) Treatment of myasthenia gravis with physostigmine. *Lancet* (i):1200–1201
4. Walker MB (MRCP) (1935) Case showing the effect of Prostigmin on myasthenia gravis. *Proc Roy Soc Med* 28(I): 759–761
5. Walker MB (MD) (1938) Myasthenia gravis: a case in which fatigue of the forearm muscles could induce paralysis of extra-ocular muscles. *Proc Roy Soc Med* 31(II):722
6. Walker MB (1973) Some discoveries on myasthenia gravis: the background. *Br Med J* 1973(2):42–43
7. Walker MB (1935) A contribution to the study of myasthenia gravis. MD thesis. Edinburgh University
8. Aitken RS, Allott EN, Castleden LIM, Walker M (1937) Observations on a case of familial periodic paralysis. *Clin Sci* 3:47–57
9. KSM (1974) Mary Broadfoot Walker MD Edin., MRCP. *Lancet* (ii): 1401–1402
10. PWR (1974) Dr. Mary Walker. *Lancet* (ii):1582

More information about Dr. Mary Walker and myasthenia gravis may be obtained on the internet at: http://www.members.aol.com/jdjandsje2/dr_mary_walker/index.htm