The answer lies in greater dental awareness and motivation of both patients and their carers, making full use of dental hygienist and dental health education facilities. Prevention is always far better than cure. Whatever is planned, it is important to recognise the oral health care needs of each individual by screening their present oral health status.

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References

- 1 Frandsen A. Mechanical oral hygiene practices. In: Loe H & Kleinman DV (ed). *Dental Plaque Control Measures and Oral Hygiene Practices*. IRL Press, Oxford, 1986, pp 93–116.
- 2 Loe H, Theilade E, Jensen SB. Experimental gingivitis in man. *Journal of Periodontology* 1965; **36**: 177–187.
- 3 Murray JJ, Rugg-Gunn AJ. Fluorides in caries prevention. *Dental Practitioner Handbook no 20* 1982; John Wright & Sons, Bristol.
- 4 Addy M *et al.* The distribution of plaque and gingivitis and the influence of toothbrushing hand in a group of South Wales 11–12 year old children. *Journal of Clinical Periodontology* 1987; **14**: 564–572.
- 5 Morton ME. Dental disease in a group of adult mentally handicapped patients. *Public Health* 1977; **91**: 23–32.
- 6 Melville MRB, Poole DM, Jaffe EC. A dental service for handicapped children. *British Dental Journal* 1981; **151**: 259–261.
- 7 Scottish Home and Health Department. *Dental services for the handicapped* 1984; Her Majesty's Stationary Office, London.
- 8 Silness J, Loe H. Periodontal disease in pregnancy II. Correlation between oral hygiene and periodontal condition. *Acta odontologica Scandinavica* 1964; **22**: 121–135.
- 9 Dummer PMH, Addy M, Hicks R, Kingdon A. The effect of social class on the prevalence of caries, plaque, gingivitis and pocketing in 11–12 year old children in South Wales. *Journal of Dentistry* 1987; **15**: 185–190.

Importance of bladder biopsies in spinal paralysed individuals (SPI)

Van Velzen and colleagues¹ compared histopathological findings of urinary bladder biopsies from the dome and the trigone in SPI. Their results showed different pathological lesions in the dome and trigone and indicate the importance of constant surveillance.

Recently we published² histopathological results of bladder biopsies of 32 para- and tetraplegics which were treated at the Swiss Paraplegic Center in Nottwil nearby Lucerne. The mean age of our collective was 42 years (range 17–73 years) and the mean time of spinal cord lesion was 11 years (range 5 months–41 years). The male/female ratio was 31:1. Each patient suffered from multiple urinary tract infections between one and six times a year. All bladder mucosal biopsies were taken from the trigone during urological endoscopic operations. Histopathological examination of these specimens proved pathological alterations in the lamina propria in 30 cases. There was chronic inflammation in 22 cases, a subacute inflammation in eight cases, a suburothelial fibrosis in 16 cases and edema in four cases.

In contrast to Van Velzen's results we did not observe metaplasias of the urothelium. We suspect that there is a correlation between the pathological alterations in the lamina propria and the so called low-compliance bladder in SPI. For this reason bladder biopsies during cystoscopy should be an essential part in the annual follow-up examinations of spinal paralysed individuals.

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References

- 1 Van Velzen D *et al.* Vaidyanathan: Comparative pathology of dome and trigone of urinary bladder mucosa in paraplegics and tetraplegics. *Paraplegia* 1995; **33**: 565–572.
- 2 Janzen J *et al.* Erste histopathologische Untersuchungsergebnisse von Harnblasenbiopsien bei der Querschnittlähmung. *Swiss Med* 1995; **12**: 1–4.

Reply from Dr S Vaidyanathan and Mr KR Krishnan

We thank Dr Janzen and colleagues for bringing to the attention of the readers of *PARAPLEGIA* their excellent contribution on 'Importance of bladder biopsies in spinal paralysed individuals'. We are pleased to know that Janzen and associates also recommend that bladder biopsies during cystoscopy should be an essential part in the annual follow-up examinations of spinal paralysed individuals. However, in their study, all bladder mucosal biopsies were taken only from the trigone, and as shown by us, single site biopsy may not be diagnostically adequate even in those patients who do not have any cystoscopically distinguishable lesion in the urinary bladder.

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Association between muscle trauma and heterotopic Ossification in spinal cord injured patients

The paper by Snoecx *et al*¹ is extremely valuable in delineating the relationship between heterotopic ossification and tears of the muscle in paraplegic patients.

It is not clear from their paper what they consider to be the causative factor in these tears. The onset came on between one and eight months of injury when they state the patients were undergoing an active programme of rehabilitation: 'all were in the stage of intensive rehabilitation and transfer activities'.

What was the relationship between the tears and passive movements of the lower limbs? Although the paper says the tears were in the psoas, were they a transverse tear or a longitudinal tear? If we knew this we would be able to relate the tear to the direction of the movement.

The reason I ask this is that in 1969² I postulated, on the basis of five patients, that there was a striking relationship of heterotopic bone formation to passive movements and trauma and I wrote:

'This series seems to offer some support for the relationship of heterotopic ossification to trauma, either by passive movements or by the use of Stryker frames and turning beds, since all three patients who had unilateral movements in the non-swollen leg developed ossification, whereas the swollen leg which was not manipulated remained free of ossification'.

I thought that this theory would be rapidly debunked as time passed but it was not and when I re-examined the problem in 1993³ in relating it directly to the passive movements in the lower limbs. I wrote:

'The incidence of HO was determined in 91 consecutive patients with traumatic lesions of the spinal cord who had been admitted to the National Spinal Injuries Centre for management and rehabilitation. Clinical data were analyzed. Clinically apparent HO occurred only in 10 of 56 patients in whom the start of passive movements to their paralysed limbs was delayed until 7 days or more from the time of injury. The findings of this study are consistent with the view that HO occurs as a result of trauma induced by passive movements carried out on joints where contractures have started to develop'.

Snoecx *et al*'s paper provides the missing link in the argument. When patients are admitted directly to a Spinal Unit and commence passive movements immediately, no contractures occur, there is no trauma and no heterotopic bone formation.

When there is a delay in admission, contractures occur and when passive movements start there is trauma as the contractures are broken down and the muscles tear and new bone develops.

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References

- 1 Snoecx M *et al*. Muscle trauma and heterotopic ossification in SCI patients. *Paraplegia* 1995; **33**: 464–468.
- 2 Silver JR. Heterotopic ossification: a clinical study of its possible relationship to trauma. *Paraplegia* 1969; **7**: 220–230.
- 3 Daud *et al*. The relationship of heterotopic ossification to passive movements in paraplegic patients. *Disability & Rehabilitation* 1993; **15**: 114–118.

Reply from Dr Snoecx

I reply to Dr Silver's comments on our paper 'Association between Muscle Trauma and Heterotopic Ossification in Spinal Cord Injured Patients: Reflections on their Causal Relationship and the Diagnostic Value of Ultrasonography' (Snoecx M *et al*. *Paraplegia* 1995; **33**: 464–468).

According to Dr Silver it is not clear from our paper what we consider to be the causative factor in the muscle tears. In a first stage we indeed found sonographic evidence of psoas muscle tears, which progressed to heterotopic ossification. However, neither the nursing staff nor the physiotherapists reported an acute trauma in these patients. Their history also was negative for traumatic events.

The sonographic studies always disclosed discontinuity, a sonographic finding consistent with a transverse tear of the psoas muscle. This is indeed suggestive of a (micro) traumatic lesion, but the exact nature of the trauma cannot be established by this method, nor can it be determined from the history. The patients were at that time undergoing intensive rehabilitation including daily ROM exercises, standing, training in wheelchair use and transfer activities.

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