

## Axillary temperature differences in hemiplegia

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### Summary

Axillary temperatures were compared in 30 hemiplegic patients. The temperature in the unaffected axilla was  $\geq 0.2^{\circ}\text{C}$  higher in 25 patients, and was  $\geq 0.5^{\circ}\text{C}$  higher in 14 patients. In 4 patients, there was an axillary temperature difference of  $\geq 1^{\circ}\text{C}$ . Axillary temperature readings should always be taken from the normal arm in hemiplegic patients.

### Introduction

Stroke patients may be unable to hold a thermometer under their tongue and therefore the axillary temperature is often taken. Broadbent (1866) noted that one hemiplegic patient had a higher axillary temperature on the affected side, but nothing has been written about axillary temperature differences in stroke since then. As infection is a common cause of morbidity and mortality after stroke, it is important to be able to detect the onset of pyrexia. If the axillary temperature differs on the affected and unaffected sides, this could have important clinical implications. The simultaneous axillary temperatures in 30 hemiplegic patients have therefore been compared.

### Patients and methods

The accuracy of 10 DHSS standard clinical thermometers was assessed by placing the thermometers in a wire rack in a water bath and testing them at various temperatures. All were found to be accurate to within  $0.1^{\circ}\text{C}$ .

A thermometer was placed under each axilla of the hemiplegic patients. Each thermometer was removed at one-min intervals, the temperature noted and the thermometer was placed under the arm again. Temperatures were recorded over 12 min.

Thirty stroke patients were studied, 13 with right hemiplegia and 17 with left hemiplegia. Their ages ranged from 40 to 75 years, and the interval between the stroke and the recording varied from one week to 3.5 years.

### Results

The differences in axillary temperatures between the normal and hemiplegic axillae are shown in

Fig. 1. Of the 30 patients, 25 had a reading of  $\geq 0.2^{\circ}\text{C}$  higher in the unaffected axilla. In 14 patients, the difference was  $\geq 0.5^{\circ}\text{C}$ , and of these, 4 had a difference of  $\geq 1.0^{\circ}\text{C}$ . The highest difference was  $1.7^{\circ}\text{C}$ .

The temperature differences observed were unrelated to the patient's age, the side of the stroke, the degree of residual arm movement, or the interval between the stroke and the temperature recording.

### Discussion

The patient described by Broadbent (1866) had a higher temperature of  $1^{\circ}\text{F}$  in the affected axilla 3 weeks after a right hemiplegia. By contrast, only 3 of the 30 patients in the present study had a higher axillary temperature on the affected side.

Broadbent made no comment on the accuracy of his thermometer or on the duration of recording. In healthy subjects, axillary thermometer readings do not reach a stable level until 11 min have passed (Nichols *et al.*, 1966), the author therefore recorded the temperature each minute for 12 min, although in clinical practice thermometers are rarely left in place for this length of time. However, the intermediate readings made at 3 min showed a similar pattern to the 12-min results, being higher on the affected side in 3 patients, equal in 4 and higher on the unaffected side in 23.

Very little has been written about axillary temperature differences. In a survey of 105 aged women convalescing in a geriatric unit, Howell (1972) used an electric thermometer to compare axillary temperatures. He found differences of up to  $1.4^{\circ}\text{C}$  but did not mention whether any of the patients were hemiplegic. Gowers (1905) described vasomotor changes in paralysed limbs and found that the paralysed limbs could be warmer or colder than on the opposite side, but he did not record axillary temperatures.

The reason for the temperature difference is uncertain. Three patients including the one with the highest temperature difference had difficulty keeping the thermometer in place on the hemiplegic side. However, the remainder had no such difficulty and temperature differences were unrelated to arm power

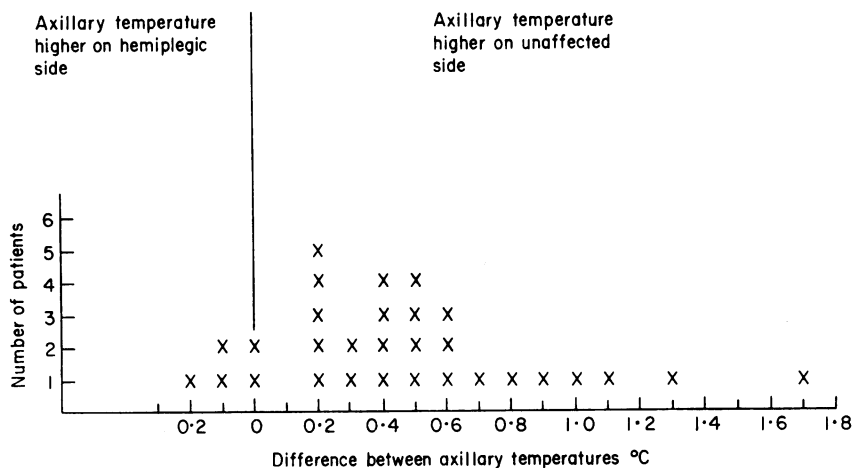


FIG. 1. Difference between axillary temperatures in degrees centigrade.

or movement. Perhaps the arterial supply to hemiplegic limbs is diminished and further studies are required to assess this.

Whatever the mechanism, axillary temperatures should always be taken from the normal arm in hemiplegic patients.

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**References**

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