

Outcomes in acute Charcot neuroarthropathy – a single centre experience over 5 years

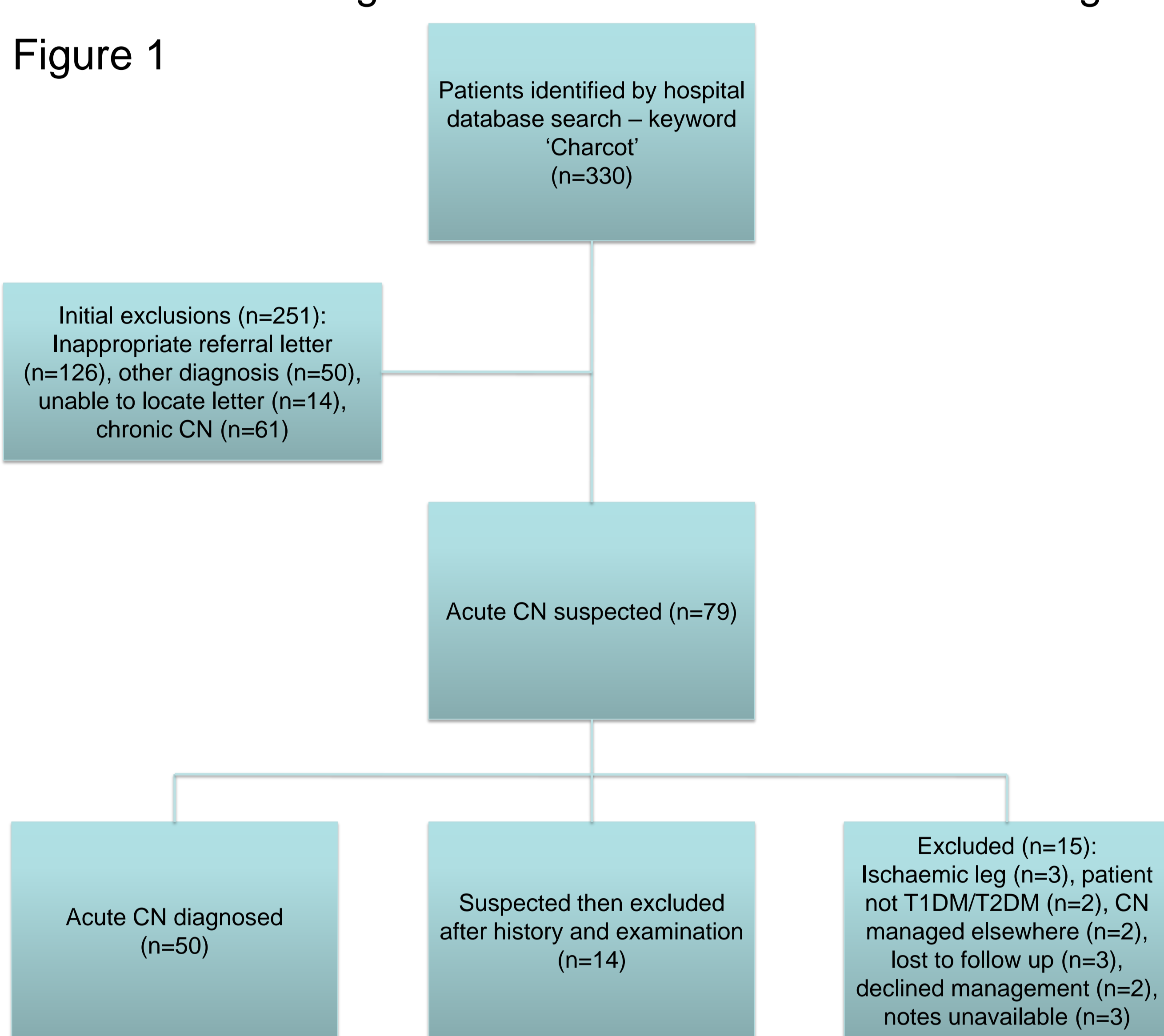
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Background: Charcot neuroarthropathy (CN) is a rare complication of diabetes. A recent, large systematic review suggested that the current gold standard management of acute CN consists of immediate referral to a multidisciplinary foot-care team followed by immobilisation of the foot in a total contact plaster cast (TCC)¹. However, there are few data describing the natural history and long term results of CN treated with a TCC. Our aim was to look at time taken to achieve clinical resolution, and to see if there was a correlation with location within the foot.

Methods: We performed a retrospective analysis of patients presenting with a new diagnosis of acute CN between October 2007 and October 2012. Figure 1 shows the numbers at each stage of the patient inclusion / exclusion criteria.

Figure 1



Results: In total, 50 patients were included, 34 (68%) were male, whilst 16 (32%) were female. 11 (22%) had T1DM, with the majority having T2DM (78%).

The mean (\pm SD) duration of DM was 17.9 \pm 12.9 years (T1DM 29.7 \pm 12.9; T2DM 14.4 \pm 10.7), with the mean age of diagnosis of CN being 62.5 \pm 11.7 years (T1DM 55.8; T2DM 64.4). The mean HbA1c was 65.4 \pm 19.8 mmol/mol (T1DM 70.0 \pm 19.2; T2DM 64.1 \pm 20.0).

41 patients (82%) had documented diabetic retinopathy present at diagnosis of CN and 38 (76%) had CKD stages 2-4.

42 of the 50 patients went into remission during the study period, with foot temperatures $<2^{\circ}\text{C}$ for greater than 6 weeks (3 consecutive visits at least 2 weeks apart to the foot clinic). Of these 42 patients, the proportion of CN by location were; forefoot 11.9%, mid-foot 64.3%, hind-foot or ankle 19.1%, and 4.8% were of multiple sites.

36 patients (85.7%) were treated with both TCC and removable offloading device. The remaining 6 patients were treated with one modality only – 5 with a removable offloading device only and 1 with a TCC only. 25 of the 42 patients (59.5%) were initially treated with a TCC, whilst the remaining 17 (40.5%) started in a removable offloading device.

Median time to resolution for patients initially treated with a TCC was 50 weeks (95% CI:40, 66) compared to the median time of 53 weeks (95% CI:35, 68) for those initially treated with removable offloading device.

14 of the 37 patients ever treated with TCC, required re-casting due to clinical deterioration of the acute CN in the removable device. The median time to resolution for these patients was 68 weeks (95% CI: 53, 89) compared to the 33 who had no re-casting, median time of 42.5 weeks (95% CI: 35, 48), ($P<0.0001$).

For the 42 patients who completed treatment, mean time (\pm SD) spent in treatment either was 53.9 \pm 28.0 weeks. Of this, mean of 30.2 \pm 25.0 weeks was spent in TCC, with 23.7 \pm 16.2 weeks being spent in a removable offloading device. For those treated solely in a removable offloading device, the mean duration of treatment was 39.0 \pm 16.3 weeks. The one patient treated with only a TCC spent 12 weeks in treatment.

8 patients did not complete treatment during the study period. 4 of these had undergone a major amputation. 2 patients died whilst undergoing treatment, and 2 patients had not completed treatment at the end of the study period.

Discussion: There is general consensus that immobilisation of the foot is necessary to prevent progression in the acute Charcot foot. However there is generally poor quality evidence to differentiate between a TCC and a removable below knee walking boot¹. Our results are in contrast to those reported by the CDUK group who found that median time to resolution varies greatly between those initially treated in a TCC compared to removable offloading device (12 months and 9 months respectively)². Our study also showed a 38.9% deterioration rate after coming out of TCC – although there were no clinical findings that would help to determine who was at risk of deterioration

Conclusion: This study has shown that the mean time to clinical resolution for a newly presenting CN was just over 1 year (53.9 \pm 28.0 weeks). Our data shows that the median time to resolution was similar for those initially treated in a non-removable TCC (50 weeks (95% CI: 40, 66)) and for those initially treated in removable offloading device (53 weeks (95% CI: 35, 68)). These results imply that there is no evidence that wearing a TCC as the initial device is beneficial in reducing time to treatment.