

Identification of factors contributing to failure of ambulatory negative pressure wound therapy in patients with diabetic foot

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Background and Aims

- Previous studies showed that negative pressure wound therapy (NPWT) is an effective method for the treatment of patients with diabetic foot
- Indication criteria of this treatment based on patient and wound characteristics are not clear verified
- The aim of our study was to assess the effect of ambulatory NPWT on diabetic foot healing and identify factors contributing to failure of this method

Patients and Methods

- 148 patients with diabetic foot hospitalized in our Diabetes Department were treated by NPWT; 60 patients continued with NPWT on ambulatory basis and were enrolled in the present study
- The changes of dressing were done in our foot clinic 2-3 times per week
- The median length of ambulatory NPWT was 23 days (7-98)
- The success of NPWT was defined as:
 - a complete wound healing during 6 months follow-up
- The unsuccess as:
 - a premature termination of NPWT (worsening of the wound/no effect)
 - non-healing during 6 months
 - major amputation
 - intolerance of NPWT by patient during 6 months
- Assessed factors influencing wound healing:
 - demographic factors: age, gender
 - diabetes-related factors: type of diabetes, duration of diabetes, diabetes control (HbA_{1c})
 - comorbidities: renal failure and other comorbidities
 - diabetic foot ulcer-related factors: presence of infection, ischemia, Charcot foot, wound localization, size, exposed bone, osteomyelitis on x-ray before NPWT
- Uni- and multivariate analyses were used to identification of factors contributing to failure of NPWT

Tab.1: Descriptive characteristics of study subjects

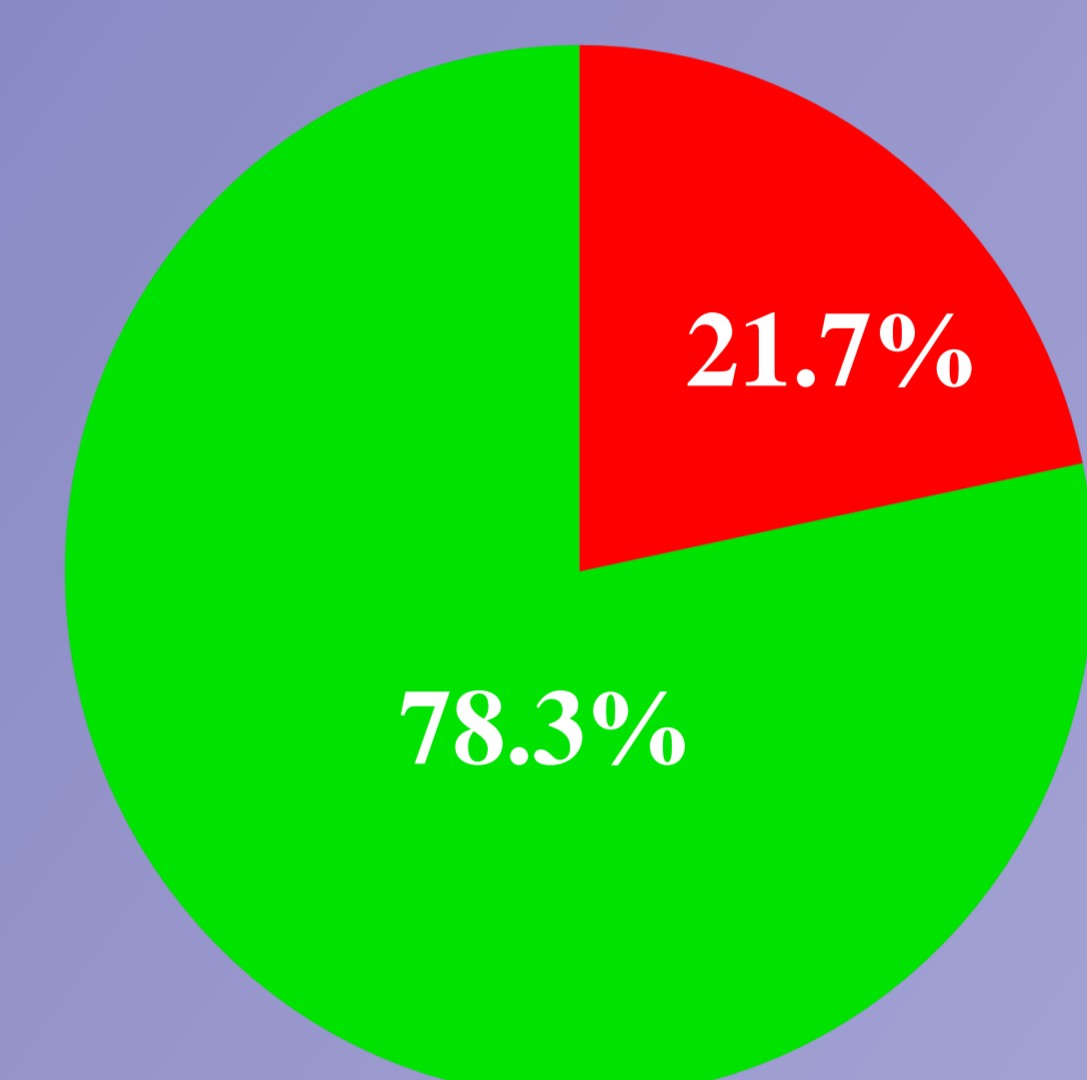
Characteristics	Ambulatory NPWT
n	60
Age (years)	59.4±12.5
Gender (M/F)	50/10
Duration of diabetes (years)	21.2±12.2
Type 2 diabetes n (%)	45 (75)
HbA _{1c} (mmol/mol)	65.7±19.5

Data are mean ± SD

Results

Fig 1: The assessment of success of ambulatory NPWT during 6 month follow-up period

- Successful healing
- Unsuccessful healing



Tab 2: Univariate analysis of factors influencing outcomes of ambulatory NPWT

Characteristics	Success NPWT	Unsuccess NPWT	p
n	47	13	-
Age (years)	59.2±13.1	60.1±9.5	0.79
Gender (M/F)	40/7	10/3	0.78
Duration of diabetes (years)	20.7±12.7	23.2±9.9	0.46
Type 2 diabetes n (%)	35 (74.5)	10 (76.9)	0.70
HbA _{1c} (mmol/mol)	62.5±18.6	77.2±19	0.01
Charcot foot (%)	19.1	30.8	0.60
Haemodialysis (%)	4.2	23.1	0.11
Resistant bacteria (%)	70.2	92.3	0.21
Exposed bone in wound (%)	48.6	76.9	0.11
Osteomyelitis on x-ray (%)	25.5	23.1	0.86
TcpO ₂ (mmHg)	47.4±11	42.5±13.8	0.28
Localization (index)	2.2	2.2	0.89
Wound < 10 cm ² (%)	29.8	30.8	0.78

TcpO₂ = transcutaneous oxygen measurement

Data are mean ± SD

Tab 3: Multivariate analysis of factors influencing outcomes of ambulatory NPWT

Characteristics	Odds ratio	95% CI	p
HbA _{1c}	1.05	1.01-1.09	0.01
Hemodialysis	18	1.6-208.1	0.02
Exposed bone in wound	7.8	1.3-48.1	0.03
Other factors			NS

Data are mean ± SD

Conclusions

- Ambulatory NPWT was effective in majority of patients, but poor diabetes control, haemodialysis or exposed bone in the wound may contribute to the failure of this method
- These results showed that patients with diabetic foot treated by ambulatory NPWT require precise follow-up focused on diabetes control and it is necessary to consider the indication in patients on haemodialysis and with exposed bone in the wound