Early detection of Diabetic Autonomic Neuropathy

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Background and Aim: Diabetic patients are at high risk of developing diabetic autonomic neuropathy (DAN). The aim of this study was to compare autonomic scoring and measurements from a new device, the ANSiscope™, made on patients with type 2 diabetes.

Methods: After approval from the ethics committee, 18 type-2 diabetic patients (mean age 48+/-7.5 years) without any complication due to DAN were included in the study. They all underwent 2 types of autonomic neuropathy assessment:
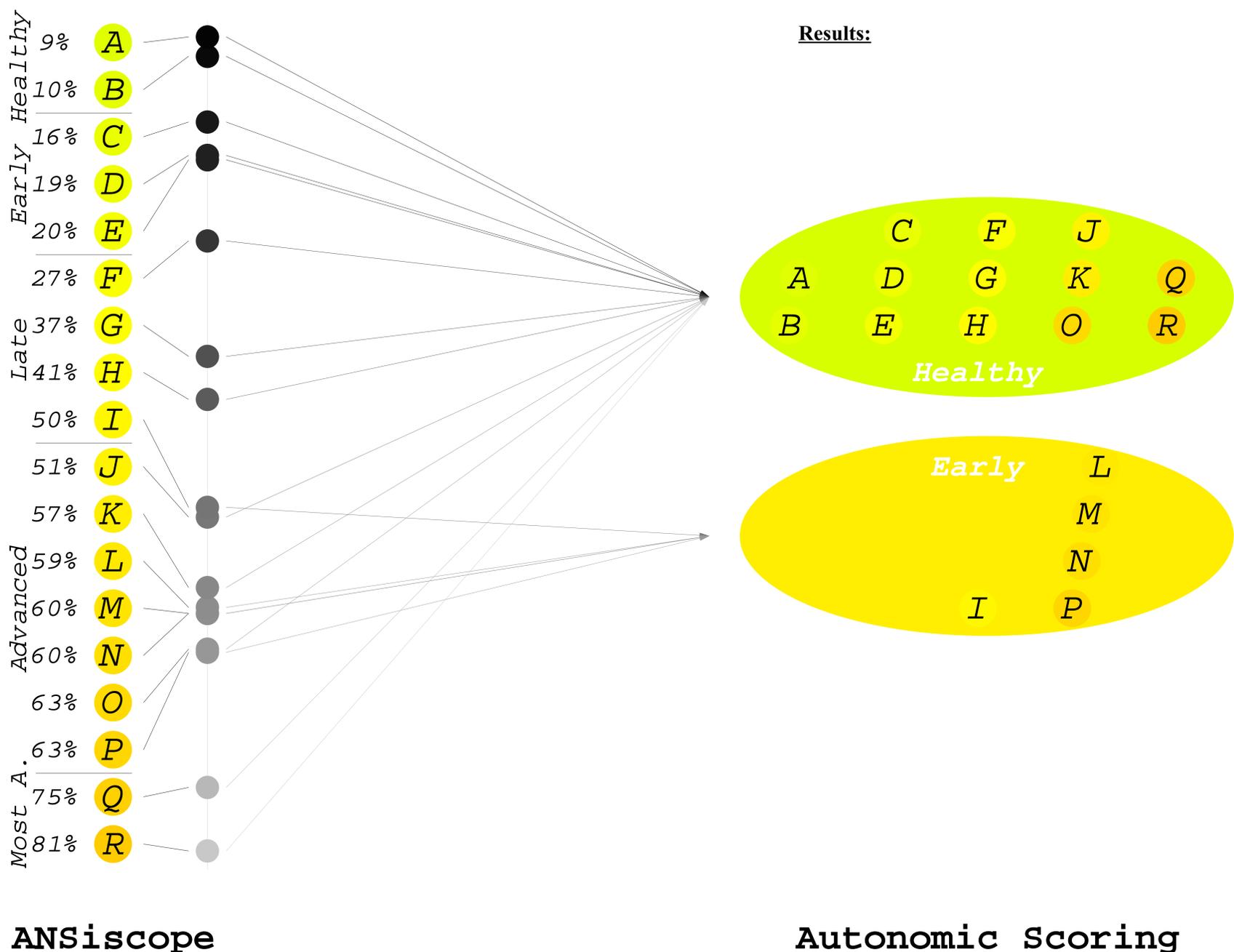
- **Autonomic dysfunction measurement with theANSiscope™** (see photograph):
The device computes a percentage of dysautonomia from a recording of 572 RR intervals (between 5 and 7 minutes) of a patient at rest in supine position.
Patients are classified as having healthy (H)/early(E)/late(L)/advanced(A)or most advanced(MA) dysautonomia.
- **Autonomic scoring**:
3 standard autonomic tests were performed : Valsalva manoeuvre, respiratory sinus arrythmia, ratio 30:15 and blood pressure fall after tilt test. Classification between healthy(H)/early(E) and advanced(A) was deduced from scoring described by Bellavere et al. Resting heart rate was used to confirm parasympathetic dysfunction in patients with most advanced DAN.

Results:

ANSiscope		Autonomic Scoring

Early Healthy:
- 9% A
- 10% B
- 16% C
- 19% D
- 20% E

Late:
- 27% F
- 37% G
- 41% H
- 50% I
- 51% J

Advanced:
- 57% K
- 59% L
- 60% M
- 60% N
- 63% O

Most A.:
- 63% P
- 75% Q
- 81% R

Healthy: C F J A D G K Q B E H O R

Early: L M N I P

Discussion: Autonomic scoring was only able to detect 2 groups of patients :13 H and 5 E whereas the ANSiscope™ detected 5 groups : 2H, 3E, 4L, 7A and 2MA. The results obtained by the ANSiscope™ were stable and reproducible. The 2 MA cases had a resting heart rate > 100, which confirms parasympathetic dysfunction. These cases were classified as healthy by autonomic scoring. **Conclusion:** When no complication indicates a dysfunction of autonomic nervous system and autonomic scoring detects only early stage of DAN, the ANSiscope™ was able to classify the patients in a reproducible manner. This device may be a useful tool to assess DAN in patients without clinical complications and help stratify patients at high risk to develop these symptoms. Furthermore, the time required for one measurement (i.e. around 5 minutes) makes it a valuable device for clinical practice.