Transillumination: A New Tool for Identifying Reliable Peripheral Venous Access

L. Mazzarella; S. Russo; M. Battistini
Caregiving Italia, Service Provider

Background

Hemophilia A is a genetic disease caused by an X chromosome mutation leading to a lack of the required clotting factor VIII, and consequently increasing the frequency of spontaneous or shock bleeds. The therapy requires the endovenous administration of the lacking factor two or three times a week.

Venous peripheral access identification in the pediatric population and among adolescents can be difficult because of the reduced size of blood vessels and the presence of subcutaneous adipose tissue. Multiple attempts of finding the venous asset can provoke physical and psychological effects such as pain, anxiety and fear. All these effects, if continued, could be the cause of aversion in the patient and his caregiver, and could threaten therapeutic continuity.

The transillumination LED device is a technology that, through a cold light beam directed to the venipuncture point with a clear angle, allows a better visibility in the patient’s peripheral venous circle and increases the vein’s individuation success rate from the first venipuncture, reducing the pain and the trauma from repeated attempts.

In this study, we illustrate several cases of people with hemophilia who were included in the Patient Support Program (PSP) KogenAID, due to the difficulty experienced in identifying their venous access because of poor visibility of the peripheral vascular system. KogenAID is a PSP for people affected by hemophilia that responds to the patient, family and Clinical Center’s needs, ensuring autonomy in the correct management of the therapy (from the drug reconstitution to infusion).

Methods

In order to simplify the training path, it was proposed to use the transillumination LED device in patients that experienced poor visibility of the vascular system.

Patients that have adopted this technology include:

- 4 year old patient prescribed with primary prophylactic treatment (1 infusion per week)
- 23 year old patient originally treated on-demand prescribed with primary prophylactic treatment (2 infusions per week)
- 49 year old patient undergoing ITI treatment (7 infusions per week)

The solution adopted of using a transillumination LED device was documented in literature from the early 70’s (Kuhns et al 1975). Specifically, we have chosen to use the product Veinlite LED. The device features 24 bright light emitting diodes (12 high-contrast orange and 12 deep red LEDs) which can work in patients with dark skin up to 6mm deep) which ensures the maximum versatility and use on patients of all ages and skin tones. The device is usable in both pediatric and adult patients, and it guarantees total security in the usage thanks to disposable covers.

Results

The main goal was reached; using an LED transillumination device improved the patient and/or caregiver training, ensuring that all participants involved in the PSP achieved a high degree of autonomy in the self-management of therapy.

The use of this technology has also provided other benefits:

- The device demonstrated to be a useful tool in the training of caregivers, both in identifying any hidden veins and in associating the visual experience to catch the vein access by tactile palpation;
- When using the device with the 4 year old patient, we discovered that the LED-light could be used to create a dynamic “game-therapy”. This has further simplified the training by reassuring the patient.

Conclusions

The LED transillumination technology is definitely a great help for the operators and/or the caregiver. It makes identifying the venous assets easier, which decreases stress and anxiety related to finding hidden veins, whilst also limiting the experience of repeated venipunctures. However, good hand-skills are always required – the device can be a great support to professionals who already have some experience in venipuncture. Even the use of the device requires some practice to avoid the possible mistakes between superficial veins and the shadows produced by the same device.

Finally, we conclude that the device can be used effectively in pediatric patients, as the ‘game-therapy’ approach brought about by the use of the device had a positive impact on the young patients.

References