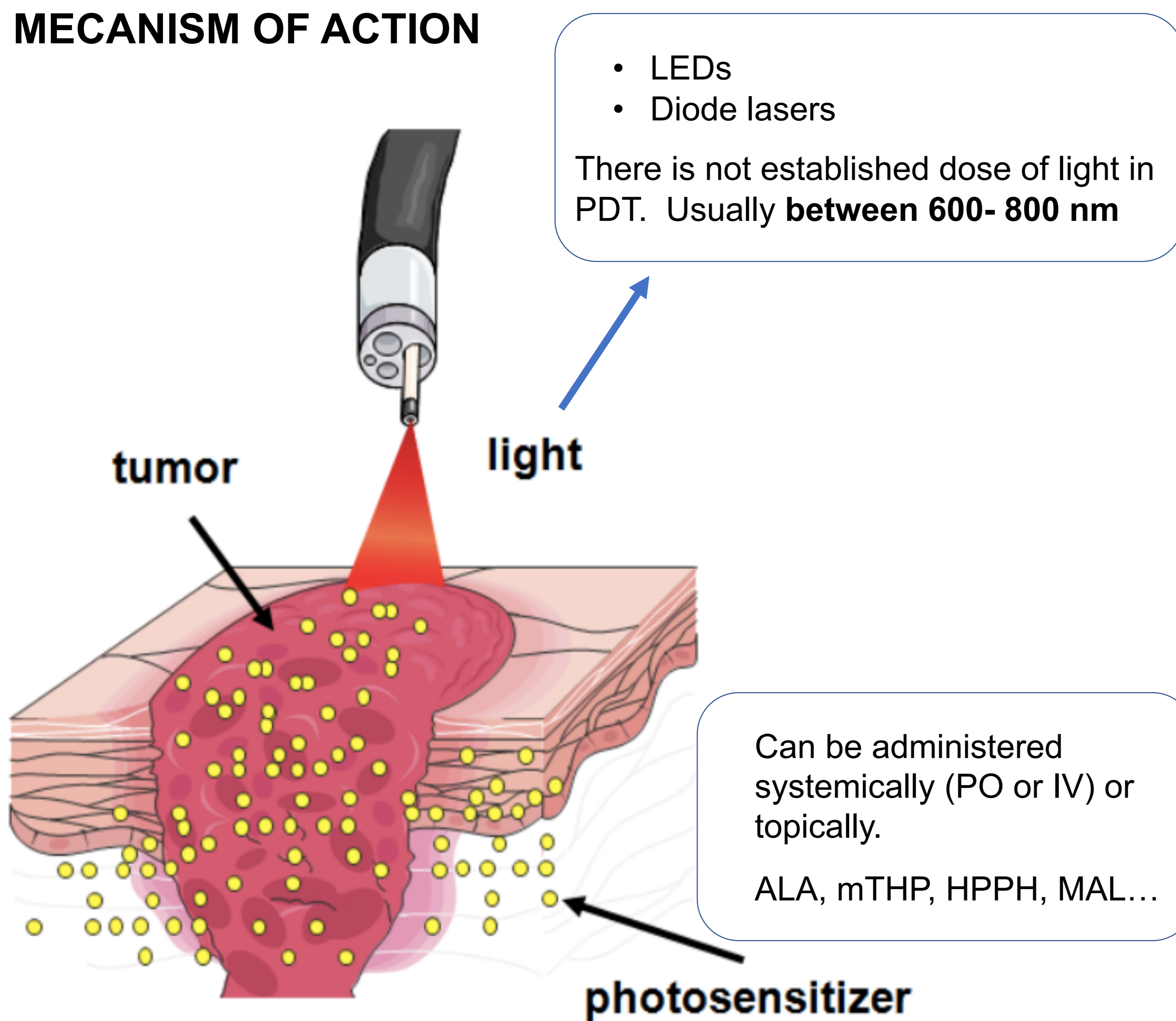


INTRODUCTION AND OBJECTIVES

The technique is based on the administration of a photosensitizing or pro-drug agent, which accumulates preferentially in the tumor tissue, and in the subsequent stimulation of the area to be treated by light of a suitable wavelength. This will initiate a photochemical process that leads directly to the destruction of the tumor cells, and indirectly causes a deterioration of the tumoral vasculature.

❖ The aim of this bibliographical review is to describe and synthesize the basic principles of photodynamic therapy (PDT), to give special emphasis to its materials and clinical applications, to make a comparison of its uses in different species.

MECANISM OF ACTION



Picture modified from Wachowska et al. 2011.

The three main processes by which reactive oxygen species (ROS) contribute to tumor destruction using PDT are:

1. Direct cell damage.
2. Indirectly, due to vascular collapse.
3. Activation of immune responses against tumor cells.

ADVERSE EFFECTS

These are not very common.

Recent studies have shown that the main adverse effects of patients after treatment with PDT are hyperemia, edema, cyanosis, exudation, crusting and immunosuppression.



Cat, male, 6 years. PDT treatment against SCC in UAB Veterinary Hospital.

MAIN USES IN TUMORS

- Squamous cell carcinoma (SCC) in cats, dogs and horses.
- Equine sarcoids.
- Basal cell carcinomas (humans).

SPECIES	CASES	OUTCOME	REFERENCES
Feline	149 Squamous cell carcinomas (SCC): nose, ear, eyelid and face.	Response ratio: 62-100%. Recurrence rate: 20-63% Mean time of recurrence: 129 days	(Stell et al. 2001)
Equine	19 Sarcoid	Response ratio: 72-93% Recurrence rate: 39%	(Gustafson et al. 2004)
Equine	10 Squamous cell carcinomas (SCC): periocular	Response ratio: 100% Recurrence rate after 25 months: 0%	(Giuliano et al. 2014)
Human	330 basal cell carcinomas (BCC)	Response ratio: 92% in superficial BCC and 71% in nodular	(Zeitouni et al. 2001)
Human	Kaposi's Sarcoma (1 patient)	Complete response after 5 treatments with PDT.	(Tardivo et al. 2006)
Canine	11 oral squamous cell carcinomas	Response ratio: 72% Recurrence ratio: 18%	(McCaw et al. 2000)

OTHER USE

Infections like leishmania, palliative treatments, keratosis, macular degeneration related to age, diagnostic method to verify that the margins remain free of neoplastic tissue after an intervention...

CONCLUSIONS

PDT offers great potential and may be useful as a complement, in a bimodal therapy, or a good alternative to certain therapies for some types of tumors in veterinary oncology. Even so, it is necessary to continue investigating and developing new photosensitizers and lasers to decrease costs and improve their results.

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