

EPR STUDIES OF PHOTODYNAMIC PROCESSES IN NASAL POLYPS

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Nasal polyps are nonmalignant fibroblast hyperplasia. Probably, different allergic and inflammatory factors contribute to their growth. At present, the main treatment options are surgery and topical application of steroid anti-inflammatory drugs. Unfortunately, because of its indirect effects and frequent setback, this treatment is often non-efficient. This situation prompts to design new therapeutic strategies restricting polyp cell growth and/or inducing their apoptosis.

Photodynamic therapy is a method which uses light energy in combination with photosensitizing agents to induce free radical cascades causing selected cell destruction. Free radical formation in laser irradiated nasal polyps was examined by electron paramagnetic resonance spectroscopy. Measurements were done by an X-band (9.3 GHz) spectrometer with magnetic modulation of 100 kHz. Individual EPR spectra were recorded during 10^{-4} s by Rapid Scan Unit of Jagmar (Kraków). Microwave frequency was obtained by MCM 102 recorder of EPRAD (Poznań). We analysed amplitudes, integral intensities and linewidths of EPR spectra. g-Factors were calculated from the resonance condition. Nonirradiated nasal polyps reveal paramagnetic properties. Broad EPR lines and strong dipolar interactions characterize nasal polyps. Free radicals concentrations in these cells increase considerably after laser irradiation.