



Electrotherapy on tattoo is to be concerned

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Tattoo is a common social trend, and it is getting more popular nowadays. A projected 10% of the adult population in the wider Western world was reported to have at least one tattoo.¹ Recently, these permanent cosmetics are getting medical professionals' curiosity about their chemical/physical properties and their effect on the dermatologic health of patients. Tattoo colorants can be made of different substances including metals such as titanium and aluminum,² other materials such as carbon and metallic compounds like iron oxide and lead carbonate are also commonly used in tattoo inks. The common iron oxide-based pigments (usually black and brown) have been shown to be ferromagnetic,^{3,4} and they could react with an external magnetic field and become magnetized.

Electrical stimulation and thermal agents are regularly used in physiotherapy for therapeutic purposes. Frequently used modalities such as transcutaneous electrical nerve stimulation (TENS) and neuromuscular electrical stimulation (NMES) are interventions which are applied through patients' skin for physiotherapy treatments. As mentioned above, the ferromagnetic compounds of tattoo pigments can be magnetized

while the metallic compounds can possibly induce electric currents.³ As a result, it is possible that if an electric current is applied on the tattooed skin, the surface temperature will increase unexpectedly and cause a burn. Furthermore, there are already case reports published that tattoo could potentially induce skin burn while taking magnetic resonance imaging (MRI) possibly due to the magnetic-induced electric current on the skin.^{3–5}

There have been safety guidelines and contraindications for the application of electrophysical therapy (EPT) on patients.⁶ Several conditions such as pacemaker, tumor and pregnancy are well documented for whether they are safe to be included or excluded but not yet for the tattoo. Some latest safety guidelines of healthcare procedures have started to highlight the concern of tattoo.⁵ but not yet on EPT. Therefore, there is a necessity to discuss and investigate the safety practice of EPT on patients with tattoo.

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