DETERMINATION OF RADIORESISTANCE OF CONTAMINANT BACTERIA IN NILE TILAPIA SKIN USED AS A DRESSING

Fernanda Simões Barna[1]; Tereza Jesus Pinheiro Gomes Bandeira[2]; Carlos Roberto Koscky Paier[2]; Felipe Augusto Rocha Rodrigues[2,3]; Edmar Maciel Lima Júnior[2]; Manuel Odorico de Moraes Filho[2]; Monica Beatriz Mathor[1*]

[1]CETER/IPEN, Brazil [2]NPDM/UFC, Brazil
[3]Burn Support Institute / Brazil
* Corresponding author: mathor@alumni.usp.br

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Introduction and objective: The use of Nile Tilapia (*Oreochromis niloticus)* skin in regenerative medicine, in the form of biological dressing for burns, is satisfactory because this biomaterial presents good adherence to wounds and characteristics suitable for the healing process, such as the high concentration of collagen type I. The treatment with the skin provides protection and decreases the number of dressing changes, reducing the patient's pain. Before use, Nile Tilapia skins need to be decontaminated and sterilized ensuring safety, since they can be contaminated by bacteria during handling. Each bacterium has a radioresistance value, which inactivates 90% of the population of that species.
Methodology: Some human contaminations at the time of handling this material: *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Pseudomonas putida*. In this work we irradiated the isolated bacterial populations from the Nile Tilapia skin with increasing doses of ionizing radiation in culture medium. Serial dilutions were performed from the total population, after gamma-ray irradiation, to enable the identification of the remaining bacterial concentration for each dose of irradiation tested.
Results and discussion: In the literature it is possible to find radioresistance to these bacteria contained in other substrates. However, it is necessary to standardize the methodology to determine the radioresistance of microbial species in the skin of Nile Tilapia, to ensure patient safety during the use of the dressing. For *Enterococcus faecalis* we obtained a value of 0.7 kGy, very similar to that described in the literature. For *Pseudomonas aeruginosa* the value found was 0.5 kGy and for *Pseudomonas putida* it was 0.2 kGy. Thus, the standardization of the methodology is in accordance with normality, also allowing the determination of radioresistance for some bacteria not described in the literature.
Conclusions: It was possible to estimate the values of the doses necessary for the reduction of 90% of the bacterial population. The radiation doses were standardized to sterilize with a safety level of 10-6, but without reaching values harmful to the histological and molecular structure of the biomaterial (above 25 kGy), so that the biological dressing is used in patients safely and doesn't lose its physicochemical characteristics.

References

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