Potential microbiological risks of KANGAL FISH (Garra rufa) THERAPY

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The fish

The Garra Rufa or reddish suction-barbel belongs to the family of the Cyprinidae, therefore it is a carp-fish. Originally from the river Kavak Deresi in Kangal (central Anatolia) the fish are now held and bred in Europe, Australia and USA.

Principles of the therapy

In human medicine Garra Rufa is more and more used as a specific therapy (KFT) for treating atopic dermatitis (neurodermitis), psoriasis vulgaris, eczema, acne and warts. Together with 150-200 fish the patient takes daily bathes over a period of 3 weeks. The fish with an approximately length of 15 cm achieves its therapeutic effect by pulling out small skin-scraps. A secreting of a ceratolytic enzymelike substance (dithranol) has not been proved scientifically yet.

Although remarkable therapeutic results of this rather extraordinary therapy have been published, no data about the potential hygienic risk of KFT have been published yet.

Potential hygienic risks

- The water for the therapy can not be disinfected chemically, as this causes the death of the fish.
- UV-disinfection is insufficient.
- The fish might be reused without quarantine.
- On applying KFT in non-therapeutic health farms and baths (already planned) different people with unknown health status might get in contact with the same fish at the same time.

Hypothesis

- Transmission of the fish-zoonoses Tuberculosis (Mycobacterium marinum, Mycobacterium piscium)
- Transmission of other harmful germs (Pseudomonas spp. and Aeromonas spp, Streptococcus spp., Staphylococcus spp., Enterobacteriaceae)
- A vector function of Garra rufa for transmitting humanpathogen virus (HIV or Hepatitis B and C)

The experiment (material and methods)

Principles of the transmission testing:

A certain number of Garra Rufa (N=100, specific pathogen free animals) is held under spa circumstances (therapy bathtub).
The fish (n=50; 2 trials) are infected with the testpathogen via prepared food (immersion: 100 TCID50).
Every minute a fish is caught, narcotized and tissue samples are taken of the mouth and tounge mucous membrane.
The samples are transmitted on cell culture (virus check) and cultureplates (bacterial check). Re-isolation of germs is attempted.
Frequence of the testing:
The virus transmission was tested twice.
The bacterial transmission was tested every 14 days over a period of 6 month

Tested germs:
Equine Herpes Virus 1 (as modelvirus for DNA-Virus)
Equine Rhinovirus (as modelvirus for RNA-Virus)
Mycobacterium piscium
Aeromonas sp./ Pseudomonas sp.
Staphylococcus aureus, Streptococcus sp.
Enterobacteriaceae

Results:
Mamalian DNA-Virus does not survive on fish tissue.
Mamalian RNA-Virus does survive on fish tissue for at least 5 minutes but does not interact with fish immune system.
Aeromonas sp. and Pseudomonas sp. propagate on fish mucous membrane, even, if they are no fish specific species (Aeromonas caviae).
Staphylococcus aureus, Streptococcus sp. propagate on fish mucous membrane if the tissue was pre-injured.
Enterobacteriaceae do not propagate on fish mucous membrane but propagate in the water.
Mycobacterium piscium propagates on different fish tissues.
Mycobacterium marinum and piscium propagate also on the KFT-patients, if the fish were stocked pre-infected.

Conclusions

- Kangal fish therapy (KFT) is a very special medical treatment of different kinds of human dermatitis, particulary atopic dermatitis and psoriasis vulgaris. Because of economical reasons the fish are reused.
- A transmission of humanpathogen virus by the vector Garra rufa can be excludes if the pause between two applications takes more than 15 minutes (->60 minutes are recommended).
- A bacterial hygienic risk of Kangal fish therapy (KFT) is proved
- in any case.
- The highest hygienic risk is caused by the fishzoonoses Tuberculosis!! Therefore the used therapy fish must be free of the germs Mycobacterium marinum and piscium.
- If the bacterial flora of fish and therapy bathtub is checked regulary and positive fish are removed, the bacterial hygienic risk can
- be controlled.

Published at 7th INTERNATIONAL SYMPOSIUM ON FISH IMMUNOLOGY 18TH-22ND JUNE 2007 STIRLING, SCOTLAND