"Extemporaneous preparation of a medicated hand gel"

Pardis Tabae Damavandi

INTRODUCTION

Gels are semi-solid pharmaceutical preparations for topical application designed to release the active principle ingredient or ingredients (APIs) to the anatomical site of interest, typically and not inescapably, the skin.

This dosage form has been circulating since at least the 60s, but popularised in recent times, particularly at due to the current outbreak where shortages of hand sanitizers have been inevitable.

The following 'research methods paper' highlights the qualitative formulation of a hydrophilic gel (or hydrogel) where the external phase is chosen based on recent studies affirming that solvents such as acetone, kill respiratory viruses inhabiting surfaces wholly within five minutes, whereas the alcohols (ethanol or isopropanol) are commonly already included, but must be highly concentrated. The latter are often found in gels, associated with the gelling agents, organically with flours-starches, algae and gums, or, inorganically, as Calcium, Zinc and silica. The API is dispersed colloiddally as an organic phase throughout the solvent mixture which constitutes the base.

INGREDIENTS AND PREPARATION

Initially the workspace was disinfected and sterilised with alcohol, then acetone, to maintain a sterile environment. Gloves were used to handle ambient temperature glassware previously rinsed and eventually sterilised and dried with acetone too.

Secondly, the APIs which make the colloidal phase were prepared via milling with a mortar and pestle. The quantities used included for a 100 g gel:

- *Rosmarinus officinalis*: 1 g.
- *Cholecalciferol*: 0.25 mg.

The hydrophilic phase by contrast involved triply decanted *ethanol* from red wine, since pure 60 to 70 % ethanol (corresponding to nearly the same volume in ml) is not available globally.

5-10% *Glycerol* was thus added to the solvent, which was in turn filled by decanted boiling water q.s. (to reach 100 ml or 100 % preparation). It is important to underline that although the water isn't a *purified* to a high degree and standard as filtered water, it is reasonably acceptable for sterile extemporaneous preparations.

0.5 % of the starch based gelling agent (rice flour) was as a result added prior to cooling taking place, followed closely by the gradual addition and continuous mixing of the colloidal APIs.

Ideally, gums are a much more sophisticated organic option than starches since their health benefits are higher, but are also expensive and cannot be purchased easily making the hand gel difficult to produce universally sometimes. It is why a starch was used; complex synthetic glycols are frequently also employed, similarly to large scale industrial hand gel productions.

Ultimately, the preparation was poured into sterile spraying flasks, sealed, and left to cool naturally in the shade.

INDICATIONS

A label was applied to the prompt gel container with indications such as "for topical use", "store in a cool dry place and away from sunlight". The expiry date of 30 days was also highlighted.

CONCLUSION

The above prepared hand gel helped and did not show toxic reaction and is thus namely safe to use dermatologically and locally (on the hands). Potential adverse reactions can be observed in allergic users. In that regard, alcohol can be replaced with water to dilute with glycerin.

Abbreviations

q.s = quantum sufficit

A.P.I. = active principle ingredient