The *in vitro* effective antiviral action of povidone–iodine (PVP–I) may also have therapeutic potential by its intravenous administration diluted with Ringer’s solution

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**Summary** The use of povidone–iodine (PVP–I) is well known in clinical medical practice. *In vitro* studies of cell cultures infected by HIV and H5N1 virus have shown that PVP–I has an antiviral action, while the cell hosts were not affected and survived. It is therefore worth investigating whether PVP–I, diluted with Ringer’s solution, may have a therapeutic effect by parenteral administration. Specifically, the question is whether small concentrations of intravenous PVP–I could be well tolerated by the human organism, and in addition, if it would be possible to detect a beneficial activity. Its intravenous use may have a potential value against infections (by microbes, viruses, fungi and parasites), as well as an anti-inflammatory activity, especially in cases where antibiotics are ineffective. It could be used as a blood disinfectant, for treating burns, for the prevention of cancer, for the therapy of H5N1 influenza after its mutation, and other potential applications.

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**Introduction**

The use of povidone–iodine (PVP–I) is well known in clinical medical practice. Its use in Dermatology and Surgery as a disinfectant is very popular and is based on the fact that povidone–iodine possesses a broad spectrum antimicrobial activity [1], including viruses [2], fungi [3] and parasites, as well as an anti-inflammatory activity [4]. It is an antiseptic solution extensively used in different concentrations.

Its use is limited to external application or intra-peritoneal administration [5,6], and up to now, any parenteral or intravenous use did not seem possible. Because of previous experience with toxic results [7,8], it has been considered that an intravenous administration can be toxic and can also provoke metabolic acidosis [9] and thyroid dysfunction [10]. Perhaps, that is the logical reason...
why intravenous use of povidone–iodine has been excluded up to the present time.

Nevertheless, it is noteworthy that contrast media in radiology containing iodine have been extensively used intravenously in clinical practice. The purpose of this study is to suggest a possible intravenous use of povidone–iodine. The hypothesis can be verified experimentally and may well broaden its spectrum of applications in clinical practice.

The hypothesis

Povidone–iodine (PVP–I) in 0.25% concentration has been reported to inactivate the HIV in HIV-infected lymphocyte cell lines [11]. In this study, the fact that the lymphocyte cell lines subsequently survive and are not harmed by the solution is noteworthy. Recently [12], it has been shown that a solution of 0.23% of PVP–I inactivates the highly pathogenic H5N1 avian influenza in vitro.

These references specify the least possible concentrations of PVP–I which exhibit antiviral activity. The question is whether these concentrations of PVP–I could be well tolerated by the human organism if administered intravenously, and if it would be possible to detect in vivo any beneficial activity of PVP–I. An initial solution of povidone-iodine can be dissolved with Ringer's solution in order to choose the most suitable dilution with a final pH equal to 7.4 (a pH which is slightly alkaline and similar to venous blood). Buffer phosphate solutions can be used as stabilizers of pH.

Estimation of the hypothesis

The PVP–I Ringer's solution is a polyelectrolyte solution, which insures the action of iodine ions, can easily be made with a low cost and can be intravenously administered, initially in laboratory animals. Once it is ensured that there are no toxic properties of PVP–I Ringer's, the solution can have many therapeutic applications as an in vivo disinfectant or an anti-inflammatory factor. It can be used in other therapeutic expectations, such as the prevention of cancer [13,14], as it contains iodine. A suggestion is made to consider these solutions as new medications and to evaluate them either by planning research or by re-examining older studies which deal with the blood and the immune system [15,16]. Positive [17,18] and negative results [19,20] should be taken under consideration.

Consequences of the hypothesis and discussion

After defining the toxicity of the solution, positive results of an intravenous administration of PVP–I Ringer's solution may become obvious. Recently, it has been shown that the use of PVP–I does not have a toxic effect on thyroid function [21]. Its intravenous use may be shown to be worthy against microbial, viral, fungal and parasitic infections, as well as to have an anti-inflammatory activity, especially in cases where antibiotics are ineffective. It may potentially be used as a blood disinfectant, for treating burns, for the prevention of cancer, or for the therapy of H5N1 avian influenza virus after its mutation [22], and other potential applications.

References


