INTRODUCTION: Heparin has been used as anticoagulant and antithrombotic
drug for more than 60 years. However, several issues concerning quality control
of pharmaceutical grade heparins are still in debate. The major source of
pharmaceutical heparin is porcine intestine, but some countries produce and
commercialize heparin from bovine intestine. Recently, we show that heparins
from porcine and bovine intestine differ significantly in their chemical structures
and effects on coagulation. Despite these differences, heparins are labeled
without information about their origins. We observed discrepancies between the
stated activity and experimentally determined activity in pharmaceutical
heparins from bovine origin. This observation could be explained by differences
among the various tests performed to establish heparin potency. The aim of this
work is compare the methodologies recommended by different Pharmacopeias
to evaluate the anticoagulant activity of heparins. MATERIAL AND METHODS:
The activity of pharmaceutical heparins (from bovine and porcine mucosa) were
assessed by aPTT assay using ovine plasma, with or without aprotinin, or
human plasma and inhibition of thrombin or factor Xa, by chromogenic assays.
The 6º International Heparin Standard was used as reference. RESULTS AND
DISCUSSION: Depending on the aPTT assay, bovine heparin presents a
variation up to 30% compared to stated activity. This discrepancy is even
greater in the chromogenic assay. Bovine heparin showed a higher
anticoagulant activity on aPTT assay using ovine plasma plus aprotinin. Overall,
aPTT assay sensibility is lower in ovine than human plasma and the presence
of aprotinin emphasizes this difference. In contrast to bovine heparin, porcine
preparation showed consistent results in all assays performed. CONCLUSION:
Our results emphasize the importance of harmonization of the methodologies
recommended by different pharmacopeias to ensure safety and efficacy of
pharmaceutical heparins, especially these of bovine origin.

Keywords: pharmaceutical grade heparins, bovine heparin, porcine heparin,
anticoagulant potency
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