1. Introduction

In the treatment of coronary diseases only the surgical intervention were considered to the 90s, but now the percutaneous radiological interventions have been widespread, sparing patients from a long convalescence time and complications after cardiac surgery [1]. In the 1990s the stents have been developed, which can open the narrowed blood vessels, and can prevent its restenosis [1,2]. Since its introduction in clinical cardiology, several studies have shown the superiority of coronary stent implantation as compared to conventional angioplasty. However, restenosis still remains a major drawback of this new technique. Basic research could identify stent-related factors like stent-material and stent-design as major determinants of intima proliferation. Since materials with good biocompatibility often have unsuitable mechanical properties and vice versa, the concept of stent coating has been developed to allow the combination of favourable characteristics from different materials [3].

Polymer coatings are needed for most drugs because they do not adhere appropriately to the metallic stent surface to insure controlled release of sufficient drug quantities in a beneficial manner. Biocompatible coatings should at least provide a surface that minimizes adverse tissue reactions, or preferably mimic a biologic substrate that can guide stent healing in a favourable pattern. Several antithrombotic agents have been or are undergoing clinical evaluation [4]. The most popular antithrombotic agent is heparin.

In some studies sheets were used instead of stents on account of hardly handling of stents too [5].

In this study the investigation of heparin binding capacity of three biocompatible polyurethane (Carbothane®, Chronoflex®, Tecothane®) coating are shown. The polyurethanes as coating on metal carrier were studied. The heparin binding capacity has measured by Optical Waveguide Lightmode Spectroscopy (OWLS) that measure the heparin elution.

2. Experimental Results

Each sheet with heparin gave higher value than the control which was soaked in buffer instead of heparin (Fig. 1,2). The Chronoflex® coated sheets gave the highest values except for the 120 minutes incubation time from the smooth coating sheets with heparin (Fig. 1), and the Chronoflex® coated sheets gave the highest values for all three incubation times from the porous coating sheet with heparin (Fig. 2).

![Means of heparin elution of smooth coated sheets](image-url)
Compared to the heparin elution of smooth and porous coating, we can see that the values of the porous coating sheets are higher than the values of the smooth coating for each type of polyurethane coatings (Fig. 3).

The increase of the incubation time caused the increase of the means of heparin elution in case of porous coating sheets with 48 hours soaked time too (Fig. 4). The Chronoflex® coated sheets gave the highest values between the samples with 48 hours incubation time. Each sheet with 48 hours incubation time gave highest values than sheets with 24 hours incubation time except the Tecothane® coated sheets.

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4. References


