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The Investigation on the Effect of the Vegetal Origin Ankaferd Blood Stopper in Experimental Intra-Abdominal Surgery Over Rabbits

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Abstract: With this study, it is aimed to conduct a research on the haemostatic effects of the herbal originated blood stopper product which is titled as Ankaferd Blood Stopper (ABS) in intra-abdominal surgery in rabbits. The materials of the study consist of 20 healthy adult New Zeeland rabbits, 10 male and 10 female ones. The rabbits were divided into two groups as working group and control group. The left abdominal part of rabbits was incised by 5 cm, their skin, cutaneous connective tissue and muscles were incised, respectively. About 1-2 mL gauzed bandage tampons which were saturated with Ankaferd Blood Stopper applied on all of 10 cases. The time passed for the blood to stop was measured by the chronometer. Moreover, bleeding spots with 1 cm length and 5 mm depth were made by bistoury on the liver and spleen. The tampons saturated with ABS were applied on the liver and spleen for 90 sec with medium pressure. The tampons with the dimensions of 4×4 cm were applied on bleeding spots of the control group with medium pressure. The time passed for the blood to stop was recorded. The time passed for blood stopping was compared. With Ankaferd Blood Stopper, the haemostasis was achieved within 9 sec for application in skin, 19 sec in coetaneous connective tissue, 42 sec in muscles, 147 sec in liver, 162 sec in spleen in experimental group while haemostasis was achieved within 220 sec for application in skin, 256 sec in coetaneous connective tissue, 238 sec in muscles, 550 sec in liver and 400 sec in spleen. As a conclusion, when the blood stopper product which is known as Ankaferd Blood Stopper is compared to the control group in external bleeding, it is seen that it achieves an effective haemostasis.

Key words: Rabbit, intra-abdominal surgery, hemostasis, ankaferd blood stopper, vegetal origin, Turkey

INTRODUCTION

The hemorrhage which is described as the blood escape from the veins is one of the most important complications which requires the most time, effort and medicine use and sometimes causes the patient's life to be lost. Various causes lead to hemorrhage. The most important cause of the hemorrhage from the perspective of surgery is the trauma and operations (Samsar *et al*., 1996).

Hemorrhage stops by itself or can be stopped by mechanical methods or blood stopper medicines. Blood stopper medicines can be used locally, orally or by parenteral injection depending on the form of the hemorrhage and on the features of the medicine that is to be applied (Samsar *et al*., 1996). In this study the aim is to research the blood stopping effects of the product called Ankaferd Blood Stopper (ABS) which is composed of the extracts of five different plants.

MATERIALS AND METHODS

In this study the material was formed by a total of 20 healthy adult New Zealand rabbits with 10 males and 10 females. The rabbits are separated into two groups as a study group and a control group. Anesthesia is provided with the combination of 5 mg kg^{-1} xylazin hydrochlorure and 50 mg kg^{-1} ketamine hydrochlorure. The left abdominal regions of the facts are shaved and after an

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antisepsis in line with the rules was done, an incision of 5 cm long was made and the hypodermic connective tissues and the muscles were incised, respectively.

In all of the 10 facts, the gauze bandage tampons, saturated in 1-2 mL of Ankaferd Blood Stopper were used. Tampons which were pressed upon the hemorrhage focus with average pressure were removed with intervals and the hemostasis was checked. The sopping time of the blood is identified with a digital chronometer as seconds and minutes.

In order to check if the blood was stopped or not, the tampons were lifted up and checked with 5 min intervals around the skin, hypoderm and in the light capillaries and with 30 sec intervals around the middle sized hypodermic and inner-muscle arteries and veins. The stopping time of the blood is identified with the method in the study group.

About 1 cm long 5 mm wide hemorrhage focuses are formed by lancet over the liver and the spleen. The ABS saturated tampons are applied over the liver and spleen with average pressure for 90 sec. At the end of 90 sec the tampon was lifted up and the formation of hemostasis was checked. On the facts where we could not ensure the hemostasis the tampons are reapplied with 30 sec intervals and the tampon application was carried on until full hemostasis was provided. The identified durations are as. In the control group, the 4×4 cm tampons are applied to the hemorrhage region with average pressure. The stopping time of the blood was identified with the method in the study group.

RESULTS AND DISCUSSION

The hemostatic effects of Ankaferd Blood Stopper (ABS) in skin incision: In 3 of the 10 facts, the hemostasis occurred in 5 sec, in 6 facts in 10 sec and in 1 fact in 15 sec. There was no hemorrhage observed in the following monitored 20 min. In skin incisions, Hemostasis was achieved in 9 sec average with the facts on which we applied ABS and in 240 sec with the control group (Table 1 and 2).

The hemostatic effects of Ankaferd Blood Stopper (ABS) in Subcutaneous tissue incision: Hemostasis was achieved in 10 sec in 2 of the 10 facts, 15 sec in 2, 20 sec in 4 and 30 sec in 2 facts.

No recurrence hemorrhage was observed in the following 20 min period. Hemostasis was achieved in 19 sec average with the facts on which we applied ABS and in 256 sec with the control group.

The hemostatic effects of Ankaferd Blood Stopper (ABS) in muscle incision: Hemostasis was achieved in 30 sec in 5 of the 10 facts in 45 sec in 2 and in 60 sec in 3. With the facts on which we applied ABS, the hemostasis was achieved in 42 sec average and in 238 sec average with the control group.

The hemostatic effects of Ankaferd Blood Stopper (ABS) in spleen incision: Full hemostasis was achieved in 90 sec in 4 of the 10 facts in 120 sec in 2 and in 180 sec in 2, 300 sec in one and in 480 sec in 1 fact. With the facts on which we applied ABS, the hemostasis was achieved in 162 sec average and in 458 sec average with the control group.

The hemostatic effects of Ankaferd Blood Stopper (ABS) in liver incision: Full hemostasis was achieved in 90 sec in 2 of the 10 facts in 120 sec in 4 and in 150 sec in 2, 180 sec in one and in 480 sec in 1 fact. No recurrence of incision was observed in the following 20 min period. With the facts on which we applied ABS, the hemostasis was achieved in 162 sec average and in 400 sec average with the control group (Table 1 and 2).

There are various substances used in the hemorrhage control. Antifibronolytic amino acids like tranexanic acid and aminocaproic acid, aprotinin and desmopressin can be given as examples. Those substances can be used systemically in cardiac surgery in internal bleedings or in

Table 1: Experiment group

Fact No.	Skin (Haemostasis time) (sec)	Subcutaneous tissue (Haem. Time) (sec)	Muscles (Haem. time) (sec)	Spleen (Haem. time) (sec)	Liver (Haem. time) (sec)
1	10	15	30	120	120
2	10	20	60	90	90
3	5	10	60	90	90
4	5	20	30	90	150
5	10	30	60	120	120
6	10	15	45	480	480
7	10	20	30	180	120
8	15	30	45	300	180
9	5	10	30	90	150
10	10	20	30	180	120
Average	9	19	42	174	162

Table 2: Control group

Fact No.	Skin (Haemostasis time) (sec)	Subcutaneous tissue Haem. time) (sec)	Muscles (Haem. time) (sec)	Spleen (Haem. time) (sec)	Liver (Haem. time) (sec)
1	180	240	220	340	300
2	160	180	200	300	320
3	200	210	180	360	420
4	360	460	320	1020	540
5	240	180	320	480	410
6	180	150	240	360	400
7	120	110	180	300	290
8	300	460	320	980	500
9	200	210	180	480	420
10	260	360	220	880	400
Average	220	256	238	550	400

some congenital coagulopathy cases but cannot be used locally (Mannucci, 1998). On the other hand, there are fibrin tissue adhesives, local hemostatic substances like collagen, thrombin and prothrombin but the use of human blood in the production of some of those presents a disadvantage while the effectiveness of others are limited.

Because of that there is always a need for new and effective topical hemostatic medicines. Since the biological substances are both expensive and have the risk of carrying a disease, the studies for vegetal origin blood stoppers are gaining momentum. Some studies on the local hemostatic effects of the plants are also reported (White *et al*., 2001; Paez and Harnandez, 2003).

Ankaferd Blood Stopper (ABS) is a medical product which is composed of the standardized mixture of five different plants in order to provide hemostasis on external hemorrhages. As an hemostatic agent, the Ankaferd Blood Stopper, which is licensed to be used in the external hemorrhages, post-surgery hemorrhages and in the dental extraction bleedings is composed of the extracts of the Urtica dioica, Vitis vinifera, Glycyrrhiza glabra, Alpinia officinarum and Thymus vulgaris plants. Those plants have many effects on blood and vein tissues (Testai *et al*., 2002; Barka *et al*., 2000, 2002; Sheela *et al*., 2006; Matsuda *et al*., 2006; Lee *et al*., 2005).

In the *in-vitro* study that was done, it is expressed that the ABS, which has an influence mechanism beyond the known coagulation mechanism, realizes the coagulation process by building a rapid protein network and by forming an erythrocyte aggregation and that it does not have any effect on the factors II, V, VII, VIII, IX, X, XI and XIII which are called as coagulation factors but that there are significant decreases in albumin and globulin levels and it is also expressed that the source of the Ankaferd Blood Stopper's rapid bleed stopping effect is the individual and combined effects of the plant extracts inside (Goker *et al*., 2008; Haznedaroğlu *et al*., 2009). In some studies it is stated that the ABS was successfully used in upper gastrointestinal hemorrhages (Kurt *et al*., 2008a, b) and that the local anticoagulative effect of ABS continues even in the case of systemic uses of the anticoagulants like Aspirin, heparin and warfarin (Koşar *et al*., 2009). It is reported that it was tried on a pig on hypoderm, liver and spleen, saphenous artery and saphenous vein (Bilgili *et al*., 2009) that it has anti-infective effects (Akkoc *et al*., 2008) and used in cardiac surgery (Dogan *et al*., 2008).

In the study, the facts that full hemostasis was achieved in small and middle scale hemorrhages of skin and subcutaneous tissues with an average of 9-19 sec in ABS groups while in control groups there were hemostasis with an average of 220-256 sec in same tissues that hemostasis was achieved in incisional hemorrhages of muscles with an average of 42 sec while in control groups there were hemostasis with an average of 238 sec that this duration of the control of the hemorrhage with ABS tampons occurred in 174 sec average while this duration was identified as 550 sec average in control group that the hemostasis was achieved in 162 average in liver incisions with ABS group while this is achieved in 400 sec average in the control group is parallel to the findings of the other researchers (Kurt *et al*., 2008a, b; Koşar *et al*., 2009; Cipil *et al*., 2009; Bilgili *et al*., 2009).

CONCLUSION

As a result, when the study group and the control group is compared, it is identified that the Ankaferd Blood Stopper constitutes a fast local hemostatic effect. Moreover, reseachers reached the conclusion that it can be used in the area of veterinary, especially in operative attempts and in traumatic cases where there are large amounts of blood losses.

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