The Effects of Arnica Montana on Bleeding Time

A Randomized Clinical Trial

Lucie Baillargeon, M.D., M.Sc., Jean Drouin, M.D.,
Louis Desjardins, M.D., F.R.C.P.C., Diana Leroux M.Sc, Danièle Audet, B.Sc.

Reproduced with permission from *Canadian Family Physician* 1993;39:2362-67.

Summary

The purpose of this double-blind, randomized, two-period, cross-over, clinical trial was to determine whether a homeopathic substance, Arnica montana, significantly decreased bleeding time (Simplate II) and to describe its impact on various blood coagulation tests. It was found that the substance did not influence a number of parameters in blood coagulation in healthy volunteers in the period immediately following administration.

As is the case in several European countries, homeopathy has become increasingly popular in Canada. This therapeutic modality is based upon the 'law of similars,' according to which a patient may be treated by dilute or even infinitesimal doses of substances which are able to produce similar symptoms in healthy subjects.[1] The efficacy of homeopathy remains highly questionable among many members of the scientific community.[2] In view of the fact that rigorous clinical trials are essential for the evaluation of this therapeutic modality, we undertook one program of clinical research with homeopathy.[3,4] This second study evaluates the effectiveness of a treatment for bleeding.

Arnica montana is a homeopathic product derived from a plant of the same name belonging to the *Compositae* family.[1] It is primarily used to prevent hemorrhaging during or following abdominal, dental, or ENT surgery, and to improve the resorption of bloody effusions. It is also used in post-partum cases to improve hemostasis as well as for many common minor cases of bleeding such as epistaxis.[1,5-8]

Unlike several homeopathic medicines, whose effects, according to homeopathic theory, seem to vary depending on the characteristics of the individual, Arnica montana is assumed to be effective among all people. Furthermore, according to many authors, every dilution equal to or lower than 5CH (10^{-10}) of this homeopathic medicine should be efficacious.[1,5,8,9]

Although Arnica montana is an immediate-acting remedy, whose action takes effect within minutes following administration, studies evaluating its hemostatic effects have not documented this aspect.[7,9,10]

The objectives of the present study were to determine if Arnica montana significantly shortens the bleeding time (Simplate II) within 30 minutes of its administration, and to describe its effects on a variety of blood coagulation tests.

Method

This double blind, randomized, two-period, cross-over, clinical trial was performed at the Centre Hospitalier of Laval University with authorization of the hospital's Ethics Committee. In Group A, subjects received Arnica montana 5CH (10^{-10}) at the first study visit. Two weeks later, Group A subjects received a placebo. For Group B subjects, the order of administration of the medications was reversed for the respective visits.[11]

Eighteen healthy male volunteers were selected. Exclusion criteria for the study included symptoms or signs suggesting a coagulation disorder or a chronic disease, smoking, or taking of any medicine or vitamin during the preceding two week period.

During the study visits, a hematology technician determined the bleeding time and withdrew vials of blood for the other analyses. The subjects then took sublingually, fifteen minutes apart, two doses of Arnica montana 5CH or placebo. The doses, prepared by Dolisos Laboratories in accordance with manufacturing requirements of the Homeopathic Pharmacopoeia, were identical in appearance. Thirty minutes after taking the second dose, the technician again performed a bleeding time and withdrew vials of blood.

Measurements

The main outcome variable studied was the bleeding time (Simplate II). The subject was seated for fifteen minutes with his forearm bared. After having inflated the cuff of the sphygmomanometer to 40 mm Hg, two incisions were made parallel to the axis of the forearm with the aid of a Simplate II (Organon Teknika). After 30 seconds, a drop of blood was collected on a paper filter. The length of bleeding from each incision was recorded and the average of these two values was taken as the bleeding time.

The other dependent variables were the platelet count, the partial thromboplastin time (PTT), the thrombin time (TT), the prothrombin time (PT), the fibrinogen and procoagulant factor VIII, and the platelet aggregation with ADP, epinephrine, and collagen. To prepare the plasma, venous blood was withdrawn in a plastic syringe with the help of a Vacutainer® needle (Becton Dickinson). Then it was transferred to a glass tube coated with silicone where it was mixed with sodium citrate 3.8% in a nine-to-one proportion. Following centrifugation at 1000 RPM for ten minutes at 22°C, the resulting platelet rich plasma (PRP) was first used to make the platelet count with Coulter® STKS. A second centrifugation of residue, at 3000

Individual values of bleeding times (Simplate II) of the seventeen subjects under Arnica montana and placebo

Group A (Arnica/Placebo)

	Period 1			Period 2			DA
Subject	T_0*	T_{30}**	Y_1***	T_0*	T_{30}**	Y_2***	Y_1-Y_2
1	7.5	6.0	-1.50	10.5	7.0	-3.50	2.00
2	6.5	5.0	-1.50	6.5	6.0	-0.50	-1.00
3	7.5	6.5	-1.00	6.0	5.0	-1.00	0.00
4	6.5	5.8	-0.75	6.5	6.5	0.00	-0.75
5	5.8	8.0	2.25	3.5	4.3	0.75	1.50
6	7.0	6.5	-0.50	6.0	5.8	-0.25	-0.25
7	5.8	6.0	0.25	6.0	7.3	1.25	-1.00
8	3.5	6.8	3.25	5.5	4.5	-1.00	4.25
Average	6.25	6.31	0.06	6.31	5.78	-0.53	0.59

Group B (Placebo/Arnica)

	Period 1			Period 2			DB
Subject	T_0*	T_{30}**	Y_1***	T_0*	T_{30}**	Y_2***	Y_2-Y_1
9	5.0	6.5	1.50	5.5	5.5	0.00	-1.50
10	8.0	8.0	0.00	7.0	6.0	-1.00	-1.00
11	5.0	5.5	0.50	4.0	4.5	0.50	0.00
12	5.5	6.5	1.00	6.5	7.5	1.00	0.00
13	5.0	4.0	-1.00	8.0	6.0	-2.00	-1.00
14	6.3	5.3	-1.00	5.0	7.0	2.00	3.00
15	6.0	7.5	1.50	9.5	9.0	-0.50	-2.00
16	5.0	5.8	0.75	4.5	4.8	0.25	-0.50
17	7.5	6.8	-0.75	8.8	8.5	-0.25	0.50
Average	5.92	6.19	0.28	6.53	6.53	0.00	-0.28

** T_0 : Initial bleeding time*

*** T_{30}: Bleeding time 30 minutes after treatment*

**** Y_1 and Y_2: T_{30}-T_0*

Tab. 1: Individual values of bleeding times (Simplate II) of the seventeen subjects under Arnica montana and placebo

Effects of Arnica montana on the different blood coagulation tests

Variable Differences*	Arnica-Placebo	(C.I. 95%)**
Bleeding time (min)	0.16	(-0.70 to 1.02)
Partial thromboplastin time (sec)	0.28	(-0.05 to 0.62)
Prothrombin time (sec)	0.05	(-0.04 to 0.13)
Thrombin time (% of control)	0.57	(-0.75 to 1.89)
Platelets (x10⁹/L)	-5.44	(-12.99 to 2.04)
Fibrinogen (g/L)	-0.16	(-0.27 to -0.04)
Procoagulant factor VIII	-0.06	(-0.13 to 0.01)

* Differences between the variables T30 - T0 under Arnica montana and placebo

** Confidence interval 95%

Tab. 2: Effects of Arnica montana on the different blood coagulation tests

RPM, furnished platelet poor plasma (PPP). From this substratum were derived the PTT, the PT, the TT, as well as the fibrinogen and the procoagulant factor VIII dosages by ACL IL 810 with the reagent Platelin Excel® LS (Organon Teknika), Thrombostat® (Parke-Davis), and deficient factor VIII (Organon Teknika). Platelet aggregation analysis *in vitro* were carried out by an aggregometer PAP-4C (Bio-Data Corporation) with ADP, epinephrine, and collagen (Bio-Data). To assess an eventual hyperaggregability, four concentrations were tested for each reagent: for ADP (5.0, 2.5, 1.0, and 0.5 µm/L), epinephrine (50.0, 5.0, 2.5, and 1.0 µm/L), and collagen (0.95, 0.48, 0.24, and 0.12 g/L).[13, 14] To carry out the platelet aggregation analysis, 0.45 ml of PRP preliminarily adjusted to 250 x 10^9 /L with the aid of autologous PPP was mixed with 0.05 ml of reagent in a silicone bowl (diameter = 0.8 mm) with a magnetic bar (1.0 mm x 0.5 mm) at the rate of 1200 RPM and at 37°C. The percentage of transmittance and the slope were recorded. These tests were performed by the hematology laboratory at the Centre Hospitalier of Laval University which is a member in the Interlab quality control program and in the same facility at the College of American Pathologists.

Analysis

The difference between the bleeding time of each subject 30 minutes after treatment (T_{30}) and the time of initial bleeding (T_0) was used as a dependent variable. These variables are presented in the columns Y_1 and Y_2 of *Table 1*. In order to quantify the difference between Arnica montana and placebo, the differences Y_1-Y_2 (D_A) and Y_2-Y_1 (D_B) were calculated for Groups A and B, respectively. The effect of the treatment is therefore the average of the effects obtained by each group. This method of analysis takes into account an eventual effect of the period, i.e., the possibility that there may be a systematic variation between periods 1 and 2 which are separated by a two week interval. First of all, the absence of interaction between the treatment and the period was verified, i.e., no carry-over effect of the treatment received during the first period was detected at the beginning of the second period. This method of analysis which is appropriate for two-period, cross-over, clinical trials was used to calculate all treatment effects and their confidence intervals.[15]

Results

Eighteen men aged from 22 to 46 years (mean=32), completed this study. One subject was excluded from the analysis because his first bleeding time at the first experimental session was longer than 9.5 minutes, a value higher than normal (2.3 to 9.5 minutes) according to the monograph of Simplate II.

Individual differences between bleeding times with Arnica montana and placebo for both groups are presented in *Table 1*. For Group A it can be seen that the effect of Arnica montana is one of increasing the bleeding time (T_{30} - T_0) by 0.59 minutes while for Group B the effect is to reduce bleeding time by 0.28 minutes for an average effect of 0.16 minutes (C.I. 95% : -0.70 to 1.02) (*Table 2*).

The fibrinogen was diminished significantly with Arnica montana. The difference was -0.16 g/L (C.I. 95%: -0.27 to -0.04) (*Table 2.*) Arnica treatment had no statistically significant effect on PTT, PT, platelet count, or on procoagulant factor VIII. Furthermore, no significant modification of platelet aggregation was demonstrated for the four dilutions of collagen, epinephrine, or ADP (*Table 3*).

In a double-blind study with 39 hospitalized patients in a surgery clinic for a variety of pathologies, an increase of platelet aggregation with collagen, epinephrine, and ADP was observed after three weeks of treatment with Arnica montana 5CH.[7] These results should be interpreted with caution since this study presented major methodological flaws. In fact, neither the nature of the conditions from which the patients suffered nor the dose of medications used to affect the coagulation tests were described in the article. In addition, the technique of platelet aggregation used is not clarified and the results are not statistically analyzed. If the results had been reproduced using rigorous methodology, they would suggest a long term effect of Arnica montana on hemostasis.

Conclusion

This study with men in good health did not demonstrate that Arnica montana has a significant clinical or statistical effect on the bleeding time in the minutes following its administration. Additionally, no clinically significant difference was observed between Arnica montana and placebo concerning the other tests of blood coagulation evaluated in this research.

Acknowledgment

We are pleased to thank Ms. Mariette Parent and Ms. Nicole Fortier of the hematology laboratory of the Centre Hospitalier of Laval University for their technical aid. We also thank Ms. Sylvie Alain and Ms. Helene Duchesneau who prepared this text.

References

1. Jouanny J. *Notions Essentielles de Matières Médicales Homéopathiques.* Ste-Foy-lès-Lyon: Éd. Boiron, 1984.

2. Morgan PP. L'homéopathie. Sa théorie tiendra-t-elle un jour debout? *Can Med Ass J.* 1992; 146(10): 1723-24.

3. Corporation professionelle des médecins du Québec. *Rapport de groupe de travail sur les médecines dites douces.* Montréal, Sept 1989.

4. Labrecque M, Audet D, Latulippe LG, Drouin J. Homeopathic treatment of plantar warts. *Can Med Ass J.* 1992; 146 (10): 1749-53.

5. Jouanny J, Crapanne JB, Dancer H, Masson JL. *Thérapeutique Homéopathique. Tome 1, Possibilités en pathologie aiguë.* Ste-Foy-lès-Lyon: Éd Boiron, 1986.

6. Guermonprez M. *Matière Médicale Homéopathique.* Paris: Ed. Doin, 1985.

7. Horvilleur A. *Matière Médicale Homéopathique.* 2e Ed. Lyon: Éditions Camuglé, 1979.

8. Kent JT. *Matière Médicale Homéopathique.* 4e Ed. Paris: Éditions P.M.J., 1932.

9. Conche B. *Effets sur la coagulation sanguine de l'Arnica à doses infinitesimales.* (thèse pour un doctorat en Médicine à l'Université René Descartes, Paris, 1979.)

10. Dorfman P, Amodeo C, Ricciotti F, Tétau M, Veroux G. Evaluation de l'activité de l'Arnica 5 CH sur les troubles veineux après perfusion prolongée. *Cahiers de Biothérapie.* 1988; 98 Suppl: 77-82.

11. Pocock SJ. Crossover Trials. In: Pocock SJ. *Clinical Trials.* Chichester: John Wiley and Sons, 1983.

12. Mielke CH, Rodvien R. Bleeding time procedures. In: *CRC Handbook Series in Clinical Laboratory Science. Section I: Hematology Volume I.* Selingson D, Ed. Boca Raton, FL, 1979.

13. Chen YC, Wu KK. A comparison of methods for the study of platelet hyperfunction in thromboembolic disorders. *Br J Haemotol.* 1980; 46:263-68.

14. Carvalho ACA, Colman RW, Lees RS. Platelet function in hyperlipoproteinemia. *N Engl J Med.* 1974; 290:434-38.

15. Hills M. Armitage P. The two-period cross-over clinical trial. *Br J Clin Pharmacol.* 1979;8:7-20.

16. Kobrinsky NL, Letts RM, Patel LR et al. 1 Desamino-8-d-arginine vasopressin (Desmopressin) decreases operative blood loss in patients having Harrington rod spinal fusion surgery. *Ann Intern Med.* 1987;107:446-50

17. Javitt JC. When does the failure to find a difference mean that there is none? *Arch Ophthalmol.* 1989; 107:1034-40.

For the authors:

Lucie Baillargeon, M.D., M.Sc.
Unité de recherche clinique en médecine familiale
Centre Hospitalier de l'Université Laval
2705 Boul. Laurier
Sainte-Foy QC G1V 4G2
Canada

This study was funded by Dolisos Laboratories.