Epsilon-amino-caproic acid in the treatment of menorrhagia

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Abstract
Epsilon-amino-caproic acid was used in 38 cases of menorrhagia. In each patient details of bleeding were recorded for four consecutive menstrual periods. Drug was given during two alternate periods and the remaining two periods were considered as control periods. Number of days of bleeding and severity of bleeding were statistically significantly reduced by epsilon-amino-caproic acid. The drug was found to be safe and effective.

Material and Methods
Patients, who had developed mild iron deficiency anemia (hemoglobin 9.1 to 12.0 g. per cent) as a result of menorrhagia were referred to the gynecologist to evaluate the cause of menorrhagia. If gynecological examination revealed no organic disease in the pelvis, patients were taken up for the trial. For the purpose of this study patients were considered to have menorrhagia if any one of the following 4 factors were present: (i) use of more than 15 pads per period, (ii) use of more than 5 pads per day, (iii) passage of clots for two days or more and (iv) period lasting for over 7 days. Patients received the drug either during their first and third period or during their second and fourth period. Thus in each patient records of bleeding during four periods were available; of these four periods, the drug was administered during two periods and two periods were without drugs which were taken as control periods. Number of days of bleeding and severity of bleeding were statistically significantly reduced by epsilon-amino-caproic acid. The drug was found to be safe and effective.

Menorrhagia is a common cause of iron deficiency anemia. [1] Menorrhagia, not associated with any disease in the pelvic organs, is a common gynecological problem also. Human endometrium contains plasminogen activator and fibrinolytic activity plays a significant role in uterine bleeding. [2] Epsilon-amino caproic acid, which inhibits activator in low concentrations and plasmin at higher concentration, [4] may be useful in reducing uterine bleeding in cases of menorrhagia. We report here the results of the use of this agent in cases of menorrhagia.

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starting on the first day of menstrual period and continued for four days. Patients were interviewed after each period and the following information about the period was recorded: (i) Total number of pads required during the period. (ii) Number of pads used on each day of the period. (iii) Passage of clots if any and for how many days. (iv) Number of days the bleeding lasted. Menstrual bleeding on any day was considered to be (a) Profuse-if (i) clots were passed or (ii) more than 5 pads were required; (b) moderate-if 3 to 5 pads were required and (c) scanty if only 1 or 2 pads were required.

:: Results

Forty-seven women entered the trial. Four patients did not turn up after third or fourth period. Three patients could not continue the trial because of the nausea produced by the drug. Two patients became pregnant before their four periods could be studied. Thus the records in 38 patients were complete and available for analysis. Their ages ranged between 19 and 36 years. Mean hemoglobin level was 10.62 (S.D. 1.2) g. per cent. Endometrial curettage was done within six months prior to the trial in 26 cases. The effect of the drug on menstrual bleeding is shown in the [Table 1].

Mean number of days of uterine bleeding per patient with and without drugs were 9.28 and 13.03 respectively. The difference was statistically highly significant (Chi square = 21.314, df =1, p<0.001).

Side effects in the form of nausea, vomiting and giddiness were mentioned by 14 patients. This includes three cases who could not take the drug for four days, because of nausea and were excluded from the trial. No other side effects were recorded.

:: Discussion

Epsilon-amino-caproic acid is an anti-fibrinolytic agent which has been used in the treatment of bleeding resulting from increased fibrinolytic activity. The drug has also been used in the treatment of bleeding where there is no evidence of increased fibrinolytic activity.[3]

Increase in the local fibrinolytic activity has been demonstrated in cases of menorrhagia. [2] There are reports of significant reduction in menorrhagia with the use of epsilon-amino-caproic acid [3][3] and this has been attributed to its local effect on uterus where there was increased fibrinolytic activity. [2] In the present study also there was statistically significant reduction in the duration of menstrual bleeding as well as on severity of bleeding which was significantly reduced. No serious side effects were encountered. It could therefore be concluded that epsilon-amino-caproic acid is safe and effective drug to control the bleeding in cases of menorrhagia.

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:: References


:: Tables

[Table 1]
Aminocaproic acid is also an intermediate in the polymerization of Nylon-6, where it is formed by ring-opening hydrolysis of caprolactam. Aminocaproic acid is used to treat excessive postoperative bleeding, especially after procedures in which a great amount of bleeding is expected, such as cardiac surgery. Aminocaproic acid can also be used to treat the overdose and/or toxic effects of the thrombolytic pharmacologic agents tissue plasminogen activator and streptokinase [1, 2]. Clinical Trial. NCT Number. [2]. Schwartz, B.S., et al., Epsilon-aminocaproic acid in the treatment of patients with acute promyelocytic leukemia and acquired alpha-2-plasmin inhibitor deficiency. Ann Intern Med, 1986. 105(6): p. 873-7. Epsilon-aminocaproic acid Drug Information from Drugs.com. Includes Epsilon-aminocaproic acid side effects, interactions and indications. Although studies on the relationship of age to the effects of aminocaproic acid have not been performed in the geriatric population, no geriatrics-specific problems have been documented to date. However, elderly patients are more likely to have age-related renal function impairment, which may require dosage reduction in patients receiving aminocaproic acid. 6-Aminohexanoic acid ≥98.5% (NT); CAS Number: 60-32-2; EC Number: 200-469-3; Synonym: 6-Aminocaproic acid, ε-Aminocaproic acid, 6-Aminohexanoic acid, EACA; Linear Formula: C6H13NO2; find Sigma-Aldrich-07260 MSDS, related peer-reviewed papers, technical documents, similar products & more at Sigma-Aldrich. 07260 Sigma-Aldrich. 6-Aminohexanoic acid. ≥98.5% (NT). Synonym: ε-Aminocaproic acid, 6-Aminocaproic acid, 6-Aminohexanoic acid, EACA. CAS Number 60-32-2. Linear Formula H2N(CH2)5CO2H. 7 Nilsson L, Rygo G. Treatment of menorrhagia with epsilon aminocaproic acid. Acta Obstet Gynecol Scand 1%5;44:467-73. 8 Carr C. Results of conservative treatment of dysfunctional uterine bleeding in the fifth decade of life. Journal of Obstetrics and Gynaecology of the British Commonwealth 1966;73:828-31. 9 Nilsson L, Rybo G. Treatment of menorrhagia. Am J Obstet Gynecol 1971;110:713-20. 10 Goldrath MH, Fuller TA, Segal S. Laser photovaporization of endometrium for the treatment of menorrhagia. Am J Obstet Gynecol 1981;140:14-9. The following may be used in patients with von Willebrand disease (VWD): Epsilon aminocaproic acid (Amicar). Inhibition of fibrinolysis. Useful in mucous membrane bleeding. Flood VH, Abshire TC, Christopherson PA, et al. Von Willebrand disease in the United States: perspective from the Zimmerman program. Ann Blood. 2018 Jan.