Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota

Plasma and Serum Transfusion Reactions

Volume XIV | Friday, January 8, 1943 | Number 10

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
UNIVERSITY OF MINNESOTA

Volume XIV | January 8, 1943 | Number 10

INDEX

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during the school year, October to June, inclusive.

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William A. O'Brien, M.D.

I. LAST WEEK

Date: December 4, 1942

Place: Recreation Room
Powell Hall

Time: 12:15 to 1:05 P.M.

Program: "Malaria" (Winthrop Chemical Company film)

Attendance: 109

Gertrude Gunn,
Record Librarian.

- - -

II. BABIES

A son born to Dr. and Mrs. Northrop Beach on December 31, 1942. Congratulations to the great grandson of Cyrus Northrop and the grandson of Joseph Beach.

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III. MEETINGS

1. SEMINAR IN PATHOLOGY

Dr. S. V. Lofsness: Hepatic injuries following cholecystectomy.
Monday, January 11, 1943, 12:30 P.M., IA 104. Visitors Welcome.

2. BACTERIOLOGY SEMINAR

At the first bacteriology seminar meeting Thursday, January 7 at 4:30 in 214 Millard Hall, Dr. Halvorson introduced the subject of microbial physiology which will be the general topic during winter quarter. Subsequent seminars will deal with chemical constituents of the microbial cell, physical properties of the microbial cell, mineral requirements of bacteria, salt effects on bacteria, accessory growth factors of bacteria, bacterial photosynthesis, microbial symbiosis, microbial antibosis, and microbial thermogenesis.
Visitors welcome.

3. TROPICAL MEDICINE SEMINAR

Marshall Hertig. "Aroya Fever"
Friday, January 8, 4:30 P.M., 318 Zoology.
Visitors welcome.

IV. ANNOUNCEMENTS

1. WE WELCOME

as associates for the winter quarter the following men from the military service who are here to study clinical laboratory methods. We trust that their stay will be profitable and pleasant.

Santo F. Brancato	Ralph J. Sewall
D. J. Butt	Hugh Shane
James Clarke	S. H. Smith
William W. Evans	Harry Sporn
Wayne A. Geib	Alexander B. Timm
Edwin N. Irons	Alfred M. Tunnell
Bertram W. Miller	Francis Vande Loo
Charles Nuebel	George L. Walker
Harold H. Ottenstein	Jerome B. Weintraub
Henry V. Ratke	

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2. WINTER QUARTER STAFF MEETING ASSIGNMENTS

Jan. 8 Bacteriology - Milton Levine
Jan. 15 Obstetrics & Gynecology - John L. McKelvey
Jan. 22 Surgery - Owen H. Wangensteen
Jan. 29 Medicine - C. J. Watson
Feb. 5 Ophthalmology - Frank E. Burch
Feb. 12 Dermatology - H. E. Michelson
Feb. 19 Pediatrics - Irvine McQuarrie
Feb. 26 Urology - C. D. Creevy
Mar. 5 Neurosurgery - William T. Peyton
Mar. 12 Radiology - K. W. Stenstrom

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3. CENTER FOR CONTINUATION STUDY PROGRAM -- WINTER QUARTER

Hospital Administration	Jan. 11-16
General Practice	Jan. 18-23
Hospital Nursing	Jan. 18-20
Blood and Blood Substitutes	Jan. 21-22
Internal Medicine	Jan. 25-30
Anesthesiology	Feb. 8-10
Dietetics	Feb. 18-20
Medical Social Service	Feb. 18-20
Rheumatic Fever	Feb. 22-24
General Surgery	Mar. 8-13

And Others.

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V. PLASMA AND SERUM TRANSFUSION REACTIONS DUE TO FACTORS OTHER THAN THE A AND B SUBSTANCES

HUMAN PLASMA and SERUM TOXICITY

Milton Levine
David State

The widespread use of serum and plasma necessitates an examination of the highly controversial subject of reactions following transfusions with these fluids. Reactions have been reported for both plasma and serum, but there is a difference of opinion as to their frequency of occurrence and their severity. Many workers prefer plasma, whereas others by continued use, seem to prefer serum. Strumia and his co-workers[1] are firm believers in plasma because of the reactions encountered with serum: "--we continue for several reasons[2] to give preference to plasma." McGuiness, Stokes and Mudd[3] prefer plasma because of the severe reactions which they observed following the use of lyophile immune sera. Havdin[4] is very definite in his opposition to serum. He states, "The frequency with which reactions have occurred following the injection of lyophile serum makes us hesitate to suggest the general acceptance of this material." He prefers plasma as a blood substitute. Meakins[5] and numerous others recently have reported serum transfusion on reactions. On the other hand, Levinson and his co-workers[6] continue to use serum and are without doubt as to its safety: "No reactions were observed or need be anticipated if serum is properly prepared." Mellanby[7] urges the use of serum, as do also Self and Scudder.[8] For ease in preparation, the latter prefer serum despite the fact that they have reported numerous reactions in cases transfused with serum.

It would seem, therefore, that serum is suspected of causing more reactions than plasma, but that some workers prefer serum for other considerations than that of reactions, and these workers either deny that reactions should occur,[6] or they are of the opinion the reactions may not be important.[8]

The literature on plasma reactions is not as copious as for serum. Because of this, many workers have assumed that reactions with plasma do not occur. However, reactions have been reported.

Stephenson and co-workers[9] reported a reaction involving chills and fever. Self and Scudder[8] reported 4.9 per cent reactions with type specific liquid plasma, 8.2 per cent with pooled liquid plasma and 5.6 per cent with dried pooled plasma, on a small series of cases. Elliott[10] reported 482 injections of plasma with three reactions. Pollayes[11] and Levine and State[12] have given detailed case studies of plasma reactions.

There are many references to reactions without detailed description as to number or type. Mahoney and his collaborators[13] simply state that, "there have been very few reactions," which would indicate that they did observe them. Strumia et al[14] talk about a "mild urticarial reaction," but conclude that the use of plasma "is simple, safe and free of reactions."[2]

It is probably correct to conclude that reactions do occur with both serum and plasma. There is some early work with serum which may explain part of its excessive toxicity. From the time Bowditch[15] first perfused the frog's heart with serum in 1871, much work was done on serum and plasma transfusion and perfusion in animals. Moldovan[16] in 1910 reviewed the literature up to that period and states the consensus on this early work to be that serum is more toxic than plasma. He feels this is due to a "fibrin ferment" formed in strictly fresh defibrinated blood or blood serum. This ferment is destroyed in about half an hour. For later reviews on the subject the reader is referred to the papers by Janeway, Richardson and Park[17] and Amberson[18]. It is questionable whether the toxic "fibrin ferment" will explain all reactions, especially when we consider that serum usually takes

more than a day to prepare and use, if we do adequate bacteriological tests for sterility.

In our experience with plasma transfusions at the University of Minnesota Hospitals, we had observed reactions following such transfusions. We attempted an experimental approach to the problem. We had decided that the evidence for the deleterious effect of incompatible antibodies in the administered plasma was insufficient to warrant our routine use of pooled plasma, which would neutralize these antibodies. We also felt that the use of group specific plasma would permit a more careful study of the factors underlying reactions than a pool which contained a number of plasmas and would, therefore, complicate the study. In addition, the practical ease of preparation of group specific plasma made its use desirable.

Shortly after the decision was made to study these reactions experimentally, we[12] observed a reaction to plasma in a patient who had been given a routine transfusion on the surgical wards. This patient G.H. was of blood group O, and developed chills, severe dyspnea and cyanosis following the intravenous administration of 150 cc of undiluted group A plasma. The possibility of incompatible agglutinins in donor plasma was eliminated in this case since the red cells of the recipient were of group O and hence inagglutinable by the administered plasma. By all theoretical immunological considerations this group A plasma should have been innocuous. We decided to skin test the patient with the plasma. Previously we[19] had suggested the possible value of such a procedure, knowing well the difficulties of skin tests in general, and yet recognizing its invaluable aid in testing for sensitivity to tetanus, pneumococcus, diphtheria and other antisera.

We found in this case, that not only did this patient give a positive skin test with this plasma, but also with three other A and on AB plasma but not with B or O plasmas. The patient was subsequently given 100 cc of A plasma with resultant chills, cyanosis and dyspnea. Group O and group B plasmas given intravenously to this same patient gave no reactions.

From the above and similar cases, we assumed some relationship between the reactions and the blood group of the administered fluid.

Moss[20] in 1910 showed that the hemolytic action of A serum on B cells can be prevented by mixing A serum with B serum. Schiff[21] later found that the serum of group A blood contained soluble A substance which seemed to have the same antigenic structure as A substance in the red cells. Levinson and his co-workers[22] found that mixing of A and B serums caused neutralization of the isoagglutinins in both sera. Lubinski[23] attributed this phenomenon to a non-specific factor, but Aubert and his associates[24] attributed this neutralization to the dissolved A and B substances found in serum and plasma of the corresponding blood groups, and were able to confirm this neutralization by pooling and by the addition of purified A and B substances prepared by Witebsky and his co-workers.[25]

We felt that these dissolved A and B substances might be responsible for the phenomena described. Fortunately we were able to obtain the purified A and B substances of Witebsky and we used this material to check our hypothesis.

We can summarize our findings as published or still in press. Patients sensitive to the A or B plasma by skin tests with repeated A or B plasmas and some AB plasmas are also sensitive by skin test to the purified substance. These patients are also sensitive to the A or B plasma or AB plasma administered by the intravenous route. They have reactions following the intravenous administration of the purified A and B substances. As control measures, all plasmas are tested for sterility. Some have been divided into two parts, part going to a sensitive individual with a resulting reaction and part to a non-sensitive individual of the same blood group without a reaction. Individuals sensitive to one group specific substance do not necessarily show sensitivity to

the other group specific substance, although we have one instance of a patient being sensitive to both.

The patients showing this sensitivity do not necessarily have an allergic history. There does not seem to be any correlation between the amount of antibody present in the recipient and his sensitivity to the factors. However, only those individuals who are in the blood group in which the specific antibody is found corresponding to the specific A or B substance, show sensitivity. Not all individuals show this sensitivity even if they have the antibody.

Are the reactions described as being due to the A and B factors important? Are they severe enough to be significant? In most of the cases, the reactions were severe enough to cause great discomfort to the patients. In all our cases, we neglected to wait for a natural outcome of the reaction, since we have found that adrenalin relieves the symptoms. It is difficult to say whether any would have proved fatal without the adrenalin. We weren't justified in withholding the adrenalin to find out. The severity of a reaction depends upon the reacting material and on the condition of the patient. A reaction which would not disturb a normal individual might kill a patient in a precarious condition. In our opinion, any reaction is important if it gives the symptoms we have described for reactions due to the A and B substances: dyspnea, fall in blood pressure, cyanosis, erythema.

A case which illustrates the practical importance of the phenomenon follows:

, a woman, age 56, blood group O, had a cholecystectomy for chronic cholecystitis on Nov. 19, 1942. Following the injection of the spinal anesthetic (10 mgm. of nupercaine between L and L_2) the blood pressure fell from 170/90 to 100/60. The pulse, however, remained between 70 to 80 per minute. She was given 30 mgm. of ephedrine and 0.2 cc of neosynephrin intravenously without elevation of the blood pressure. The spinal anesthesia was supplemented with cyclopropane. For the first hour of the operation, the blood pressure remained at about 100/60 and the pulse between 70 to 80 per minute. When the blood pressure failed to rise, the patient was given 500 cc of pooled equal parts of A and B plasma intravenously. Ten minutes after the plasma was started, the blood pressure fell from 100/60 to 80/40 and the pulse rose from 80 to 110 per minute. It was then noticed that the patient had developed a generalized giant urticaria. The plasma was stopped, the patient was given 500 cc of 5 per cent glucose in saline and 3 cc of metrazol intravenously with elevation of the blood pressure to 110/60 and a fall in the pulse rate to 90 per minute. The skin test to the administered plasma was strongly positive (on the operating table). Subsequently the patient was skin tested and found positive for numerous B plasmas and the purified substance. Skin tests and intravenous administration of type A plasma were without incident.

This case indicates that reactions occur under anesthesia and that they may be serious if unrecognized.

Following the recognition of the factors responsible for some plasma reactions, we were interested in the effec of pooling on the production of these reactions. Although our experience with pooled serum or plasma in cases sensitive to the A and B substances is less extensive than with group specific plasma, we have some results which are indicative. In one case previously reported[26], the patient was sensitive to both the A and B substances. Skin tests to pooled plasma in ratios of 5:1, 2:1, 1:1 (A:B plasma) were positive. This confirmed previous observations on other patients[27]. This patient developed a reaction to a transfusion with A plasma but not with O plasma. We then obtained a batch of pooled serum from the Human Serum Center at the University of Minnesota. The pool contained 8 group O, 8 group A, 3 group B and 1 group AB sera. It gave a positive skin test, and after 10 cc had been given intravenously, the patient developed a generalized erythema apiphora, dyspnea, rapid pulse and a fall in blood pressure. The same serum pool gave no re-

action in a non-sensitive individual.

Another case illustrating the effect of pooling on the response to administration of the plasma in sensitive individuals is given above ( ). In this patient, a reaction occurred following transfusion of a pooled specimen of equal parts of A and B plasma which also gave a positive skin test. The patient was only sensitive to the B plasma.

It may be that patients sensitive to a single factor may not show as marked a reaction to pooled plasma or serum due to the dilution of the A and B substances. Where the patient is sensitive to both factors, dilution would play less of a role. Neutralization of the A and B factors, in the proportions tried, does not occur in pooled specimens of plasma or serum, hence pooling is not a sure method of preventing reactions due to these substances.

We have evidence that reactions may occur due to other factors than the A and B substances. We have reported three cases of such reactions previously[26]. We feel that the following may be the cause of reactions when the A and B substances are not involved:

1. The presence of allergens in the plasma or serum.

2. The presence of reagins in the plasma or serum.

3. The presence of pyrogens.

4. The presence of immunological factors as yet unknown.

To illustrate transfusion reaction due to factors other than the A and B substances, we present the following cases observed at the University Hospitals in Minneapolis: Case 1. , a woman age 44, of blood group O, had lower and middle lobe lobectomy of the right lung for a bronchial adenoma on 12/11/42. During the operation she received 400 cc of equal parts of A and B plasma and 300 cc of A plasma without reaction. On the second post-operative day, 5 minutes after 200 cc of type A plasma had run in, she developed a severe chill lasting 20 minutes with an elevation of temperature from 99 to 101°F. The skin test with the plasma which gave the reaction was positive, but tests with other plasmas, both A and B and the purified A and B substances were negative. On 12/14/42 she received 200 cc of type A plasma without reaction.

Case 2. ., an 18 year old male, had a right herniorrhaphy on 11/12/42. He was given 500 cc of type AB plasma on 11/19/42, 500 cc of type B on 11/20/42, 500 cc of equal parts of groups A and AB on 11/21/42, 500 cc of equal parts of groups A and B on 11/23/42. Approximately 1 hour after the latter plasma had been given, the patient developed a chill and a fever of 101.6°F. The fever persisted for 12 hours. Skin tests to all plasmas were negative.

Case 3. , male age 44, group O, had a partial colectomy on 11/4/42 and an enterolysis and enterostomy on 11/10/42. During the postoperative period following the second operation, he received 200 cc of type O plasma and a similar amount of the same type of O plasma on 11/20/42. On 11/21/42, approximately 20 minutes after receiving 200 cc of type O plasma, the patient developed a moderately severe chill and fever of 102°F. The patient was not skin tested with the reaction-producing plasma but subsequent tests with other group O plasmas gave negative results.

Case 4. , a 62 year old male of blood group A, had a partial colon resection for carcinoma of the sigmoid colon on 12/14/42. On 12/16/42, he received 200 mgm. of equal parts of A and B plasma and 400 cc of type A plasma without reactions. On 12/18/42 he developed severe itching and urticaria after receiving 200 cc type A plasma. The skin test with this plasma was positive. On 12/19/42, after receiving 200 cc of type A plasma, he developed a moderately severe chill and fever of 103°F. The blood pressure fell from 114/70 to 100/70 and the pulse rose from 90 to 120 per minute; the respiration rate increased from 24 to 32 per minute. The skin test to this plasma was also positive. On

12/20/42 and on 12/23/42, he received 200 cc of type B plasma without reactions. On each of these occasions, the skin test was negative.

It would be difficult to assign a definite cause to these reactions, but the positive skin test would be more likely to occur associated with an allergic than with a pyrogen type of reaction. It is certain, however, that these last cases are not due to the A or B factors.

We recognize the tendency on the part of clinicians to either overlook reactions or to find them "where they are not." We cite the following case to illustrate a possible false reaction, and to demonstrate our awareness of the possibility.

Case 5. , 70 year old male, group O was acutely ill with pyonephrosis. He had daily chills and fever ranging from 100 to 103°F. On 12/10/42 while receiving 200 cc of type A plasma he again developed chills and fever at 103°F. The skin test with the administered plasma was negative. This onset of the chills and fever while plasma was being given was probably coincidental with the daily chills and fever this patient had shown previously. This conclusion was strengthened, although not necessarily proved, by the negative skin test.

Conclusions

We have demonstrated what we consider to be important transfusion reactions due to the A and B factors in both plasma and serum. We have also observed other reactions due to factors in plasma other than the A and B substances. We have found the skin test with the plasma a good method of indicating sensitivity to the plasma in many of the cases and an aid in preventing transfusion reactions.

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DISCUSSION

In previous publications (1,2) we have reported reactions following the transfusion of group specific human plasma. These reactions were shown to be due to the presence in the plasma of the A and B factors which Schiff[3] first demonstrated in human serum. These A and B substances are heat stable substances present in plasma and serum of the corresponding group A and B bloods. Thus a group A blood contains the antigenic A factor in the erythrocytes, and in addition, there is present in the plasma a factor either identical with or similar to the red blood cell substance. Skin tests with A and B plasma and the purified substances developed by Witebsky[4] demonstrated that skin sensitivity to these substances correlated with transfusion reactions following their intravenous administration.

We are now reporting observations on a group of 5 cases elaborating the original findings and demonstrating, in addition, human plasma transfusion reactions due to factors other than the A and B substances.

In all but one case, individuals exhibiting sensitivity to A or B plasma showed this sensitivity to only one of the two plasma types. We have recently encountered one patient sensitive to both the A and B substances. This case permitted a study of the effect of pooling on the sensitivity, since in this instance, a combination of A and B plasmas would not dilute the reacting substances as would be the case if the individual were only sensitive to a single factor.

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Case 1. , male, age 43, Blood group O, diagnosis, inguinal hernia.

Repeated skin tests to A and B purified substances and to A, B, and AB plasma were positive. O plasma gave a negative skin test. On September 10, 1942, he received 100 cc. of undiluted type A plasma intravenously. After approximately 20 cc had run in, the patient developed a generalized erythema, epiphora and dyspnea. The skin became cool and moist. The blood pressure dropped from 130/60 to 104/60. The pulse became rapid and weak. These symptoms were allowed to continue for about 10 minutes. He was then given ½ cc of 1/1000 adrenaline hydrochloride intramuscularly with rapid relief. On Sept. 11, 1942, the patient was given 100 cc of undiluted O plasma without reactions. On Sept. 12, 1942, skin tests to pooled equal parts of A and B plasma were positive, as were also the skin tests to a commercial pool of serum* containing 9 group O, 8 group A, 3 group B, and 1 group AB serums. Subsequent transfusion with the pooled serum giving the positive skin test resulted, after 10 cc had been given, in generalized erythema, epiphora, dyspnea, a fall in blood pressure and a rapid pulse. These symptoms were relieved again by the intramuscular injection of 1/2 cc of 1/1000 adrenaline hydrochloride. As a control, 100 cc of the same serum pool was given to a non-sensitive patient without reactions.

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As suggested in an editorial[5] in the Journal of the American Medical Association, we skin-tested this patient on Sept. 22, 1942, with pooled A and B plasma in the ratio of 5:1 and 2:1. The skin tests in both these dilutions remained positive. We were, however, unable to transfuse this patient with plasma in the above ratios at this time.

The results obtained in this case confirm our previous observation[1] that pooling does not neutralize the skin reacting substance, nor necessarily, the transfusion reaction properties of the A and B factors. It also demonstrates that no single ratio of plasmas or serums in a pooled specimen, as suggested by Aubert and his associates[6] is sufficient to neutralize the reacting substances.

Transfusions not due to the A and B substances

Many of the skin tests which were run routinely proved to be positive to one particular plasma, regardless of the blood group of that plasma. Patients sensitive to such individual plasmas were not sensitive to other plasmas of the same group nor to the purified A and B substances. Two cases follow in which a transfusion was given using the same plasma causing the positive skin test.

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Case 2. , male, age 36. Blood group B. Diagnosis, perforated peptic ulcer. On June 24, 1942, he was skin-tested with a group A plasma, which produced a wheal indicating a positive test. Intradermal inoculation of other A plasmas as well as B abd AB plasma and the purified A and B substances yielded negative results. He was transfused with 300 cc of the A plasma, giving a positive skin test, and 45 minutes after the plasma had run in he developed moderately severe chills and a fever of 101°F. He was subsequently given 100 cc. of group A plasma, producing a negative skin test, and no reaction resulted.

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*Distributed by the Human Serum Center, University of Minnesota.

Case 3. ., male, aged 23. Blood group A. Diagnosis, acute appendicitis. On June 24, 1942, skin tests to group A, O, AB plasmas and purified A and B substances were negative. One group B plasma gave a positive skin test. Other group B plasmas gave negative skin tests. A transfusion of 110 cc. of the group B plasma giving the positive test resulted in diffuse articaria, itching, oedema of the eyelids, dyspnea, a rapid pulse, and labored respirations. Subsequent transfusions with two group B plasmas yielding negative skin tests resulted in no reactions.

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In one other case a reaction followed the routine administration of 150 cc. of group AB plasma. Since all the plasma was administered before the reaction occurred, it was not possible to skin test with this particular plasma. Tests with other AB plasmas and with the purified substances indicated that the patient was not sensitive to the A and B factors.

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Case 4. , female, age 43. Blood group O. Diagnosis, acute pancreatitis. On Aug. 7, 1942, she was transfused with 150 cc. of group AB plasma, and developed a generalized erythema with diffuse wheal formation. This persisted for 3 hours, despite the immediate administration of 3/4 cc. of 1/1000 adrenaline hydrochloride intramuscularly. Previous and subsequent to this she had multiple transfusions with plasmas of all blood groups without reactions.

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The cause or causes of the plasma transfusion reactions when the A and B substances are not at fault, are unknown. We have previously suggested iso-agglutinins, pyrogens, allergens, or other as yet unknown immune factors. Our investigations[7] indicate that there is no correlation between plasma sensitivity and iso-agglutinin titres. It is a matter rather of qualitative relationship between the sensitive individual and the reaction-producing properties of the transfused iso-agglutinins. There is strong presumptive evidence that allergens may be the principal cause. A case illustrating the transfer in plasma of reagins to ragweed pollen offers evidence for this possibility.

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Case 5. , male, age 56. Blood group O. Diagnosis, carcinoma of the breast. This patient had no history of allergy, food idiosyncracies or asthma. On Sept. 11, 1942, a patch test for ragweed pollen sensitivity was negative. He was then transfused with 200 cc. of plasma obtained from an individual who had a typical ragweed pollen sensitivity and who had been exposed to the ragweed pollen. No reaction ensued. On Sept. 12, 1942, the skin test to ragweed pollen was 3+.

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Although this last case does not directly indicate that allergens are the cause of reactions, it demonstrates the transfer of the antibody-like substance involved in an allergic reaction.

Since plasma and serum transfusions are of such importance in the armed forces, these findings are of practical importance in military medicine. It is our opinion that the skin test as described[1] should prove of value in eliminating some of the reactions.

Summary: Reactions to transfusion of human plasma and serum are described. These reactions are due to sensitivity to the A and B substances in the plasma, and to other factors as yet incompletely understood. Skin tests aid in eliminating these reactions.

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7. To be published.

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VI. GOSSIP

The Christmas holidays have come and gone. If the Christmas spirit could prevail the year around this would be a wonderful world in which to live. Credit is due the Traffic Club of Minneapolis for providing our patients with another joyous Christmas season. This organization is responsible for decoration of the trees and providing the gifts. They also collaborated in the Christmas program. We do not know how Santa Claus could get along without our own Dorothy Jones who again proved to be one of his most efficient helpers. Dorothy, who has completely recovered from her recent accident, found time to help Santa Claus bring two gifts to each child, a fruit basket for every adult, and to assist the carolers in their trip around the hospital. The Traffic Club is fortunate in having Santa Claus as a regular member of their group. The rest of the year he bears a striking resemblance to H. G. Christianson, who disappears around Christmas time only to come back after the University of Minnesota Hospitals have been visited. Many of the departments carried on with their regular open house programs. Others were abandoned for various reasons. Notable programs are provided each year by the Health Service and the department of surgery. Smaller gatherings occurred in other units throughout the institution. One of the features of Christmas week was the operation on one Michael Raymond Amberg, superintendent of these hospitals, who gave his gall bladder to the institution. As good measure he threw in some stones and a difficult technical procedure. His surgeon, Owen H. Wangensteen, his medical advisor, Cecil James Watson, his radiologic consultant, Leo George Rigler are grateful to him for his generosity. We are delighted to announce that he is making an uneventful recovery and will soon be one of us, filled with his old time geniality and vigor. Lieutenant Norman O. Holte postcards from "over there" telling of the armistice day trip to London with special mention of places visited. He wishes to be remembered to all the staff. The holiday season brought joy and sorrow to Sister Elizabeth Kenny. The City of Minneapolis, through the public health center, provided a ward for her patients. This special facility which is a branch of the Minneapolis General Hospital and staffed by that institution will give her a more convenient place in which to carry on her treatments and teaching. As usual the programs of instruction for physicians, nurses, and physical therapy technologists will be given through the Center for Continuation Study. Now for the sad part - the Honorable One contracted mumps from her patients. She is now recovered and for the next two months will travel extensively in connection with special meetings and attempt to secure some rest and relaxation. Engineer Olson and McGilp of our staff became fathers during December. "Scotty" McGilp, whose slight frame is such that he is credited with crawling through pipes to locate obstructions, is the proud father of 5 children. A distinguished University associate during the winter quarter is Haven Emerson, one-time professor of preventive medical practice at Columbia U. He is teaching in our department of preventive medicine and public health in the absence of Gaylord Anderson, now in the army. Haven Emerson is one of the bright stars in this field, and everyone interested in preventive medicine and public health is looking forward with a keen anticipation to his presence in our midst. Our good friend, Edward Leo Tuohy of Duluth, has come through with a literary masterpiece in the current issue of the Journal of the American Medical Association. He writes on feeding the aged. Few men are better qualified to speak on this subject as he has been an ardent student of the problem for some time. Dr. Tuohy correctly points out that geriatrics will never be a specialty but that all physicians and surgeons must understand the problems of those in middle and late life. Scattered here and there throughout the scientific literature one finds references to conditions which affect the aged. Dr. Tuohy in his masterful way has gathered these references together and placed them side by side with his observations of the habits of his patients. Environmental medicine which still remains the great contribution of our century has provided Dr. Tuohy with excellent material. His studies of trends in the practice of his group should point the way to our thinking in the future. Everyone is talking post-war reconstruction and education is not immune. Our institutions must keep in mind the aging populatior which confronts us.....