

The role and significance of autotransfusion in Transfusion Medicine today

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The advantages (and disadvantages, or limitations) of autotransfusion, in its different technical and medical procedures, have been the object of several reports, since its very beginning.

A better understanding of the impact of autotransfusion procedures on the improved medical outcome of carefully selected groups of surgical patients has been reached, through Consensus Conferences^(12, 39, 40, 43, 48, 49, 50, 51) and scientific debates in the medical literature^(3, 8, 9, 15, 16, 18, 35, 41, 43, 52). The introduction of erythropoietin into medical treatment has widened the field of application of autotransfusion^(12, 32, 34) and increased its effectiveness.

The practice of autotransfusion has not attained the same level, and has not been accepted with equal favour in different nations and areas of the world, according to the different cultural, medical and transfusional traditions. Its implementation has been only marginally considered in many national, or international, laws or directives on blood transfusion.

The main biological and clinical advantages of autotransfusion have been initially recognized^(4, 5, 19, 25, 26, 28, 31, 39, 40, 41, 47) in the following ones:

- 1) absence of any risk of transfusion-transmitted infections;
- 2) absence of any risk of alloimmunization to any blood cell antigen.

Besides the obvious observation that the above advantages can only be considered absolute if *all* the blood transfused to a single patient was autologous, with no integration by the homologous supply, their relevance in today's Transfusion Medicine needs to be re-analysed and re-assessed.

1) Absence of any risk of transfusion-transmitted infections

The exceptional increase in popularity of autotransfusion has certainly been due to the worldwide explosion of the AIDS pandemics, and to the diffusion within the general public of a new critical appreciation of all medical procedures, and of blood transfusion in particular.

The "duty" for the attending physician to be able to offer to the patient the possibility of autotransfusion prior to asking him an informed written consent to perform homologous transfusion, originally conceived as a moral and professional duty only, has been pushed in some cases to the level of a legal duty, posing relevant organizational and social problems. A wave of "criminalization" has sometimes attained some Blood Transfusion Centres which could not customarily offer autotransfusion as a regular alternative to homologous transfusion. It is fair to say that the practice of autotransfusion was born in some cases out of these legal or professional worries, rather than out of a perfectly formed conviction of its intrinsic medical advantages.

The value of this motivation (blood "safety") has been progressively diminished by the spectacular progresses made in the screening of donors' blood for infectious agents.

Thanks to the reinforcement of the practice of purely voluntary, non-remunerated periodic blood donation, and to wide-ranged and perfected search for immunological or genomic signs of transmissible viruses in donors' blood, one can surely state that homologous blood has never been as safe as today, and that homologous blood

transfusion is by large one of the safest procedures as compared with many other medical procedures.

This holds true in nearly all Western "developed" countries. But one can not forget that "blood safety" (meaning by that an "acceptable" degree of safety) is still a door yet to be open in many "developing" countries, also in Europe.

2) Absence of any risk of alloimmunization to any blood cell antigen

Whether one considers red cell, or platelet, or white cell antigens, this advantage seems rather obvious, and by itself not affected by any scientific progress in immunology in recent years.

While on one side the motivation of "forbidden alloimmunisation" still holds valid, and so will stay in my opinion for many years to come, one should consider on the other side the current progress made in understanding and elucidating the effects of the "immunomodulation" exerted by homologous blood transfusion: if some positive immunomodulatory effects in the recipient patients should be confirmed in the medical literature, these benefits could overshadow the negative risks of unwanted alloimmunizations, and the delicate balance between homologous and heterologous transfusion could be shifted again in favour of homologous blood.

Other arguments should be considered today, concerning the practice of autotransfusion and its regulatory policy.

Let us consider 2 classical "disadvantages", often quoted in the medical literature^(1, 3, 16, 17, 22, 23, 36, 37, 53).

- 1) increased possibility of misidentification errors;
- 2) excessive cost of autotransfusion procedures.

It is my firm conviction that these arguments don't hold true, but only originate by misconceptions due to the lack of adequate regulations and efficient operational policies.

3) Increased possibility of misidentification errors

Autologous blood units are rarely considered and processed with the same meticulous care prescribed (by laws and directives) for donors' blood units.

Specific and detailed regulations for autologous blood are lacking in many countries.

Recent results of national surveys within existing haemovigilance programmes (France, Great Britain) have on the other side confirmed the high frequency of misidentification errors in patients receiving homologous blood, and the absolute need to secure in all cases a safe identification patient/unit through specific technical procedures.

Where similar procedures have already been implemented for autologous blood, no errors have been observed.

4) Excessive cost of autotransfusion procedures

This has been a real argument in many circumstances, when proper measures have not been taken in adequate consideration:

- A) a critical number of procedures: the higher the number, the lower the personnel's time, due to experience and self-confidence, with increased efficiency and lower costs;
- B) autologous blood doesn't obviously need the laboratory tests for homologous blood to be performed, and their cost can be spared.

Moreover, the disposal of autologous blood units that had not to be transfused should be considered obvious, and not be considered a negative factor in the economical balance.

It is, however, certainly true that the economy of autotransfusion procedures could be drastically improved if the autologous blood, once drawn from a patient, could be indefinitely stored for him as frozen blood. The added cost of freezing equipment and organization should be weighed against the economies in medical and personnel's time in future occasions: not to consider the inherent clinical advantages, for the patient, to have the possibility to be auto-transfused in future emergency occasions, that would not allow him to timely auto-donate again his own blood.

From all the above considerations, the role and significance of autotransfusion seem to emerge still unabated in today's Transfusion Medicine, provided clear clinical criteria for its indications are set^(2, 4, 5, 12, 26, 42), and an adequate organization is in place^(20, 24, 28, 30, 36).

This seems to be true both in "developed" and "developing" countries, where the "safety" motivation can still exert its important additional influence.

Paradoxally, as a consequence of the madly increased costs met with to increase safety of donors' blood in developed countries, an other strong motivation for autologous transfusion has emerged and needs to be discussed: the relative economic convenience of autologous blood units compared with increasingly costly homologous blood units.

5) Relative economic convenience of autologous blood units compared with increasingly costly homologous blood units

As already stated, autologous blood doesn't need any blood testing for transmissible infections.

Some Blood Transfusion Centres feel otherwise, fearing the unsustainable responsibility of the consequences of a misidentification error; in case the autologous unit should be wrongly transfused (untested, and potentially infectious) to an other patient.

This circumstance having to be by no means avoided through other effective specific measures in all cases, the rational basis for the above excess of precaution seems to be very weak.

On the other side, the cost of homologous blood units (thanks to completely irrational, fear-driven policies of many politicians, dictated by an ill understanding of the "precautionary principle") is steadily increasing in many developed countries, and will soon reach levels that will prove impossible to be sustained by even the wealthiest national health economies.

It is not difficult to foresee, by obvious reaction, a strong revival of the practice of autotransfusion, as soon as hospital and public health administrators will have perceived its reaffirmed economic convenience.

As a conclusion, I want to stress that we must therefore be ready: to practice autotransfusion as a customary part of Transfusion Medicine; to perform it at the highest possible medical and organisational quality level; to expand it further, always according to strict clinical indication, whenever possible, in the field of our clinical activity.

To these aims, the ESTM has given its contribution by organising 2 specific courses^(29, 31) and introducing issues on autotransfusion in other 2 courses^(11, 13), so that many aspects of the different procedures of autotransfusion^(5, 6, 7, 10, 14, 19, 20, 21, 24, 25, 26, 27, 28, 30, 32, 33, 34, 36, 37, 38, 42, 44, 45, 46, 49, 53, 54) could be covered in the last years.

I feel that the present course, beautifully organised by Dr. Vanda Brubnjak-Jevtic, perfectly corresponds to this aims.

The specific competence of the lecturers, and the dedication of our Slovenian hosts, are a sound guarantee of a very good course.

My warmest thanks to Dr. Brubnjak-Jevtic, to the teachers and to all the participants for having allowed me to be with the ESTM in Slovenia for the third time.

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