

Difficulties in achieving a sustainable blood supply: report from the first national seminar on blood donation in Lebanon.

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Abstract

Lebanon has a decentralized/fragmented transfusion system and like most Middle Eastern countries, its blood supply is mainly based on replacement/family donors (around 70-75%). On the occasion of the World Blood Donor Day (14 June 2017), the Lebanese National Committee of Blood Transfusion (LNCBT) organized its first seminar to analyze the current status of blood supply in Lebanon, its main actors and the problems it faces in order to determine how to best meet blood demands. Although a lot of efforts were made by the Ministry of Public Health (MoPH) in the transfusion field during the last decade, the present blood supply does not fulfill the target of the World Health Organization (WHO) defined as achieving 100% voluntary non-remunerated blood donation (VNRD).

The LNCBT advises the MoPH to be more engaged in the field of transfusion medicine and especially in the blood supply aspect. In order to do that, the LNCBT recommends establishing a blood supply committee with the mission to draw a national strategy, allocating adequate human/financial resources, harmonizing practices across all blood banks and exploring the psychological factors associated with blood donor recruitment and retention. The objective will be to overcome the numerous roadblocks that prevent donors from donating regularly and ultimately achieving a sustainable and safe blood supply based on 100% VNRD by the year 2025 (as per WHO recommendation).

Keywords: Blood supply, blood donation, voluntary non-remunerated donors, Lebanon

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Introduction

This study summarizes the content of the presentations that occurred during the first World Blood Donor Day seminar in Lebanon, held 14 June 2017 at one of the major healthcare facilities in Beirut—Hôpital du Sacré Coeur. This seminar was under the patronage of the Lebanese National Committee of Blood transfusion (LNCBT) during which all major stakeholders in transfusion medicine analyzed the various difficulties occurring in the field of Blood Supply.

Blood is essential in assisting and providing optimal patients' health care (1). In spite of many advances in immuno-haematology, blood components are still produced from human origin and thus considered as a rare resource. In many high-income countries, Patient blood management (PBM) and optimal use of blood programmes reduced the red blood cell components (RBCCs) demand and supply (2). Whereas low and middle-income countries are facing increased need in blood components as more patients require transfusion due to ageing, development of surgical and specific medical care procedures and to high prevalence of haemoglobinopathies in certain regions (3).

Among these countries, Lebanon has a decentralized/fragmented blood transfusion system and the blood donation is mainly hospital based with a small part performed by NGOs either alone (Lebanese Red Cross) or in association with hospital blood banks (the “Donner Sang Compter” Association etc.). Thus, blood supply is mainly based on replacement/family donation (around 70–75%) and cannot meet World Health Organization (WHO) recommendations. Indeed, WHO recommended regularly that blood supply should be in each country entirely based on voluntary non-remunerated donors (VNRD) because this type of donation is the most sustainable and safest for both donors and patients (4).

Effectively, a volunteer-regular donor is committed to ensure blood sustainability and possess enough knowledge to recognize risky behaviours that can potentially cause harm for self and recipients. This is very critical especially in transfusion systems that do not perform nucleic acid testing (NAT), which is the case in most Middle Eastern countries including Lebanon (5). In fact, each country has its own blood transfusion system and blood donation varies from what is nearly a national service as found in the United Arab Emirates, to a completely hospital-based blood banking system such as Saudi Arabia and Palestine, and a mixture of partial unified to hospital-based blood banking system as in Egypt and Jordan (6). That is why, in the last meetings of the WHO regional committee (2009 and 2016) (7,8) members urged Middle Eastern countries to establish and implement a national blood system with well-coordinated blood transfusion activities and to make attempts towards reaching 100% VNRD as of 2020 (7), later on postponed to 2025 (8).

Having identified hurdles and road-blocks preventing the achievement of the WHO goal, Lebanon is still seeking the best strategy/plan to improve its blood supply in the time frame set by WHO. The seminar had the objective of detailing the currently available Lebanese blood supply systems, the major roadblocks as listed by the national professionals/experts, and suggest practical recommendations for national authorities that could assist them in achieving 100% VNRD.

The current Lebanese blood transfusion service

Lebanon is characteristically ruled by a liberal economic system that values most private initiatives and the right of private property (9). However, it is particularly difficult to set up a public plan to overview transfusion medicine (TM) as the healthcare system is by essence chiefly within the private sector. As a matter of fact, TM is not considered a “public health affair”, in opposition to what WHO recommends (10). Almost 83% of the healthcare activities take place in private facilities while only 17% in public facilities (11). There are 140 hospital-based blood banks (HBB); around 60 are licensed by the MoPH of whom only 9 collect more

than 4000 units per year and 36 collect single donor apheresis platelets (unpublished data from MoPH).

Each healthcare facility runs its own HBB, usually integrated in the Department of Clinical Laboratory Medicine or of Pathology. HBBs are overseen and under the responsibility of physicians (either clinical pathologists or haematologists) (5), of whom only a minority are specialized in TM. HBBs collect mainly whole blood, process it according to a national standard that comprises universal leukoreduction (in force as of 2013), then proceed to the quality and safety testing according to a national standard (HIV1/2 Ag/Ab, HCV Ab, HBs Ag, Anti-Hbc and VDRL) and finally establish their own inventory with the ABO and RH:1 (RhD) groups. Other blood groups are not standard. Patients are then tested in the same department that proceeds to indirect Coombs (anti-globulin) test and cross-match. Blood products in Lebanon are invoiced as laboratory tests and reimbursed by public and private insurances, while patients pay a part of the hospitalization bill. Consequently, the national blood transfusion service is extremely fragmented and decentralized (12).

There are currently in Lebanon three different types of donors/donations: 1) replacement/family donations are estimated to be around 70–75%; 2) VNRDs represents around 20 to 25%; and 3) compensated donations are estimated to be around 5–10% (5). Remunerated donations are officially forbidden according to Lebanese law since 2006; penalties can be applied to donors or patients if financial incentive was proved during donor recruitment. However, this law does not specifically mention any third-party payers (13). Thus, theoretically no donors are remunerated but it has come to public knowledge that cases of recruited donor remuneration can occur in Syrian or Palestinian refugee camps and in situations when patients outside a defined community have reduced family, friends or relatives circles.

The replacement/family donors/HBBs donors

Replacement/family donors are those who give blood upon request by a member of their own family or community or a friend; thus, replacement donation involves the patient directly in donor recruitment and the mobilization is based on principle of restricted solidarity either in the family or friend circles and acquaintances/community members (14). Usually these donors arrive in a group accompanied/encouraged by friends/family members. They are motivated by the belief of “giving a service” and in some way they may feel obliged to donate. Despite the donation is for the HBB and not directed to the patient him/herself, the latter is placed under a “debt of gratitude” due to his/her proximity to the replacement donors. In addition, the issue of anonymity arises in such donations since donors and patients know each other even though the donation is a replacement one (5).

Most Lebanese HBBs consider such donors as their main source to procure blood, and thus by requiring a replacement donation from the patient family – relying on replacement donations only – they place this system in a vicious circle and refrain from the switch to VNRD. Actually, some HBB try to convert some replacement donors to VNRD even in the absence of a relative in need, although with limited success as most candidates prefer awaiting that a real need is specifically addressed, thereby fueling the vicious circle as well.

The role of the Lebanese Red Cross (LRC)

The Lebanese Red Cross (LRC) represents one of the largest humanitarian organizations in Lebanon and a key factor in fulfilling the blood demand for transfusion purposes. Through a 13-blood centre-network spread over the whole Lebanese territory, the LRC is instrumental in the transfusion field. All centres are equipped to efficiently provide a full service in blood transfusion, from collection to processing and testing. The LRC envisions regarding its role in the transfusion process is that each patient in need in Lebanon receives blood products timely, safely and efficiently.

The LRC accounted for around 15% of the national blood supply in 2016. Meanwhile, the LRC is facing the same difficulties in targeting blood donors as do HBBs. While delivering blood products components to HBBs upon request of the patient's family, the LRC has to replenish the inventory and, to achieve this task, it addresses replacement donations. The majority of donations in the LRC centres originate from family/replacement donors and not VNRD (around 9.65%). One of the main LRC's objectives is to promote VNRD in order to increase their contribution to the HBBs need and to achieve a blood supply based exclusively on VNRDs. A short-term objective has been set to attain 5000 VNRBD—around 25% of total donations by 2020.

Recently, the LRC launched a Blood Donor Recruitment form, which is an online portal where prospect voluntary donors can make an appointment to give blood at their own convenience. These donors can even specify how many times per year they wish to donate. Another major goal of the LRC is to increase the capacity of blood centres for welcoming blood donors. Therefore, it is sought to set up unique units dedicated exclusively for donor recruitment. Next, the LRC is currently implementing a quality management organization to optimize, among other tasks, the coordination with healthcare facilities. The LRC is eager to alleviate the psychological burden put on patients' families begged to bring replacement donations.

The role of nongovernmental organizations: the case of the “Donner sang compter” association

Without a specific need, Lebanese citizens remain reluctant to donate blood and ignore the media demand, which is a very serious issue. To overcome this negative attitude, a nongovernmental organization (NGO) was established 12 years ago with the goal to help meet all blood demands, and goes by the name of “Donner sang compter” (DSC) with the aim of creating a network of voluntary donors willing to freely give blood around the clock throughout the year. Donor identities are kept strictly confidential through the call centre to preserve anonymity and to avoid social or financial coercion. This network of voluntary donors is supposed to meet demand even in cases of over demand. However, it is currently overstressed as not only HBBs but also Lebanese citizens rely more and more on DSC. While the patient family used to procure, for example, four out of the five needed blood units and rely for the fifth on DSC, it is not unusual currently that family ask DSC to provide all needed BCs instead of complementing the missing one of five. It is acknowledged that DSC substitutes for replacement donors; this nevertheless weakens the global inventory as it is clearly not enough. DSC is only fulfilling 30–40% of its current demand and cooperation of all stakeholders is thus highly needed.

The DSC started recruiting donors on social media where most young potential donors are active. In addition, numerous blood drives were conducted in partnership with HBBs all over the year in many public places such as universities, shopping malls and business premises in order to increase their inventory and ultimately decrease the burden placed on patients’ to provide blood units/donors. Awareness campaigns and events were also conducted in these public places in order to increase the donor database and to dispel some of the many misconceptions surrounding blood donation in Lebanon. DSC donors are genuine VNRDs donating anonymously and motivated only by the donation experience in contrast to the replacement donor.

DSC considers that even if blood components are regularly reachable, the problem consists of the stress burden caused by blood demand that affects the whole system with specific pressure on hospitals, families and donors. Moreover, the DSC faces serious problems such as discrepancies between HBBs regarding guidelines and eligible criteria for donating; waiting times are too long in some facilities due to organizational issues; and if the first donation experience has not been successful, then donors may be reluctant to take part in future donations. Thus, the DSC is currently focusing its practice on the donation experience by providing comfortable and air-conditioned buses, certificates, entertaining videos while donating and memorabilia (information leaflets, stickers, memory cards, bracelets etc.) to signify a sense of belonging to donor group.

In summary, DSC believes that further collaboration with HBBs is needed as well as a merger with other NGOs to create a national federation for blood donors supervised by the MoPH. Another suggestion would be the development of a quality management system including collect donors' feedback and complaints in order to improve donor satisfaction and thus maintain regular donations.

Specifics with the Shiite community: The “Ashoura” donation experience

Lately, the Shiite community has been working to improve the image of Ashoura by discouraging practices of self-flagellation and having surrogate gestures in mourning towards making blood donation. Self-flagellation is the traditional commemoration of mourning the murder of the imams Hassan and Hussein; having worshippers inflicting self-bleeding commemorates in particular the 10th day of this annual celebration. A considerable change regarding this ritual was suggested in 2009 when one of the most respected Ulama in the Shiite community encouraged the replacement of self-flagellation with voluntary donation. However, in 2009, a major hospital (affiliated to the Shiite community) faced an emergency situation precisely on the 10th day of Ashoura and the HBB was mobbed by dozens of donors. With the help of the nursing staff, the HBB collected around 130 donations but still could not manage to have them volunteers donating. Since then, the 10th day of Ashoura became an opportunity to donate spontaneously in the Shiite community at this hospital. This experience raised awareness regarding the impact of religious motivation in this hospital administration; it was then considered that year-long regular offerings of donating blood would better meet the demand (such as specific occasions, Friday prayers etc.). These strategies have had a significant impact on the supply of the relevant HBBs.

The Lebanese Army Blood Bank: role and responsibilities

The Lebanese Army holds one of the biggest HBBs in Lebanon, which collects around 10 000 blood donations per year. From the Army's point of view, other problems exist such as:-1) a lack of national transportation procedures to ensure the safety of blood products; and 2) a lack of efficient and trustable networks among HBBs for exchanging blood units.

Consequently, the quality and safety of blood products issued by the Lebanese Army to healthcare facilities to transfuse hospitalized soldiers/families is exposed. In addition, as some of these facilities tend to repeat all screening tests, the financial burden on the healthcare system is increased. The vast majority of donors with the Army HBB are soldiers agreeing to donate blood “voluntarily” as a national duty and part of their commitment to military service. The donor recruitment is driven by the demand of specific blood groups. Those who donate can receive a compensatory day off, or a reimbursement of transportation costs if any, as well as a

moderate fee to cover meal expenses; this is collectively aimed at manifesting gratitude. Thus, soldiers cannot donate whenever they want but only when they are requested to, which depends on demand. Soldiers usually donate twice a year and anonymity between donor and recipient is guaranteed.

Most army donors are males, aged 18–40 years, and originate from the very many confessions. The Army meets all blood demands for Lebanese soldiers and families. The Army stands as a model of integration of donation by all religious groups and a standard for regular donation outside of the replacement donation within communities.

Availability and safety of blood during humanitarian emergency management

Managing blood donation during emergency situations started raising discussions in scientific communities especially after the September 11, 2001 attacks in New York, where only few units were transfused while several thousand had to be lately disposed of. This experience contributed significantly to the improvement of blood management during humanitarian emergencies. Similar situations were also reported three years later during the Madrid train attack and in France during the 2015 winter and autumn terrorist attacks (15-17). As one can notice, the majority of injured people during terrorist attacks or natural disasters either dies before arriving to the hospital or has superficial injuries and don't need transfusion.

As for Lebanon, the 2006 war experience and the last terrorist incident on 12 November 2015 (where respectively 15% and 24% of injured civilians were transfused), call for two commentaries: First, the percentage of injured people needing transfusion was higher compared to Western tragedies, perhaps because of the nature of injuries and weapons. Second, the number of collected units is almost the same as to those actually transfused; this demonstrates that management of blood collection was adequate, at least for the moment. Indeed, in the southeastern suburban of Beirut (where the last terrorist incident took place) there are five middle size hospitals complying with a local emergency preparedness plan, which consists in having a target minimal stock of blood and applying an efficient networking blood supply system. This plan has proven its efficacy since blood was available for all injured patients.

Based on these two Lebanese experiences, numerous challenges during emergency situations were identified as follows:

- To face a war situation it is essential to procure blood for soldiers on the battlefield even when the infrastructure has collapsed, and to cope with an increasing demand merging both an influx of injured people and loss of donors at the same time.

- To face a terrorist attack it is essential to maintain an adequate stock of blood products, organize accurate schedules for on-call staff in order to be able to absorb the influx of donors, and organize a network for adequate transportation between nearby healthcare facilities.

Consequently, it is now central to conduct a study in order to define the needed inventory in case of terrorist attack (based on previous experiences) and how to avoid spillage. Furthermore, a “media coordinator” available in case of casualties is needed to assign donors to the diverse healthcare facilities or re-orientate them, and to eventually stop the rush once enough blood is collected. Not only donor candidacies are the problem to be solved but also the logistics to collect them according to need, both in terms of devices, goods and human resources.

Of particular note concerning those dramatic events was the fact that the Lebanese donated voluntarily and massively in emergency situations, reflecting a sense of national solidarity. The challenge is how to manage the rush of donors in such situations, which would demand an efficient network between HBBs and organizations (Lebanese Red Cross, Army, NGOs etc.) to collect optimally.

However, when looking back to the impact of emergency donations on the sustainability of blood supply, the studies carried out in Lebanon (2006 war), United States of America (11 September 2001) (18) and Islamic Republic of Iran (earthquake 2009) (19), show a common feature which is a low return rate when the situation returns to normal. This means that most first time, occasional donors will not return, irrespectively of culture. Furthermore, HBBs in Lebanon also learnt that those donors upon arrival in the facility expressed some reluctance to comply when the situation is not perceived as exceptional (e.g. chronic patient with a need for platelets) if the need for emergency has been fulfilled. This echoes well with what was observed in the United States after the 11 September 2001 attacks; the American Association of Blood Banks (AABB) director stated at that time that the current issue was no longer the availability of sufficient blood donors, but the disruption to the blood supply system itself. Consequently, in Lebanon there is a still need to combat the misconception of donating voluntarily only in emergency circumstances by educating people and introducing the values of voluntary donation.

Relevant questions (background)

In order to improve safety in TM and to achieve a safe, reliable and sustained national blood supply, the Lebanese authorities represented by MoPH established the LNCBT in 2011 and contracted during the same year the French blood facility Établissement Français du Sang (EFS)

to assist this committee in addressing this task. The agreement was arranged through the Beirut-based French-Lebanese Business school, Ecole Supérieure des Affaires (ESA). Since then, despite the several advancements made over years regarding blood processing/testing and safety (see below), the issues of achieving a VNRD-based recruitment and ensuring nationwide sufficiency have still not been met.

Lebanon is a country which has suffered civilian and military strife over the past decades, preventing the creation of a reliable and uniform healthcare organization nationwide; furthermore, Lebanon relies mainly on a private sector economy, and the current status of the blood supply in Lebanon is mainly based on replacement/family donors overseen by HBBs for their own internal use (5); this clearly does not fulfill WHO recommendations. Hence, two important questions need to be addressed: 1) how can such a decentralized system progress in making a blood supply capable of meeting the demand?; and 2) what would be the most important steps to address? In parallel to the joint collaborative and practical programme with EFS, an academic investigation has been launched with the National Institute for Blood transfusion in Paris, France (INTS) in collaboration with the University of Lyon/Saint-Etienne. The latter programme is aimed at addressing epidemiological and sociological issues to better understand Lebanon's needs in blood supply and transfusion safety. The programme has been expanded to all countries of the Maghreb and Levant (20).

World Blood Donor Day: an opportunity to seize to engage discussions

The LNCBT took the opportunity of celebrating World Blood Donor Day (WBDD), 14 June 2017, to host a half day seminar and organize round table discussions involving all main stakeholders of the blood donation process in Lebanon. Each year since 2004, and upon the invitation of WHO, one country is chosen as the official celebration host and a slogan is released, aimed at attracting the attention of populations and country health authorities. In 2017, the host country was Vietnam and the action slogan was: "What can you do? Give blood. Give now. Give often." (21). This was felt to be a great opportunity for one Beirut hospital through its HBB to host this national seminar in order to: 1) spread awareness for the need of safe blood and blood products; 2) thank blood donors for their life-saving blood gifts; 3) promote regular donations; and 4) make it visible nationwide. It was also a great opportunity to explain nationwide why donating is crucial because blood products have expiry dates, imposing a regularly renewed inventory to avoid blood shortage.

The event's more specific aims were also: 1) to enlist the current types of donations in the country; 2) to discuss reciprocal advantages and disadvantages; 3) to identify the main roadblocks in achieving a VNRD-based blood supply; and 4) to draft a consensus-based road

map that can be forwarded to the MoPH. The long-term objective of this seminar was to help the MoPH to take actions in favour of a more generalized VNRD in the country.

Moving forward in improving the transfusion process: the MoPH's project

The MoPH is responsible by law for the efficient supply of blood products and for the overall quality, safety, availability and equitable distribution of these products. This task is particularly difficult to achieve in the absence of a well-organized national blood transfusion service governed by a national public health policy (WHO recommendations) (10). The MoPH director advised by French experts/LNCBT has identified that at a minimum, a quality and safety system should oversee good transfusion practices in the whole chain, including blood grouping, compatibility, viral screening and processing, standardization of donor selection and reporting system. This was assigned to LNCBT. Next, the LNCBT should consider the promotion of VNRD (difficult to achieve because of the absence of human resources in the Ministry) and setting up of patient blood management and optimal blood use programmes.

Several actions were undertaken by the MoPH, delegated to LNCBT in collaboration with ESA/EFS (11), specifically: 1) the development of good transfusion practices (2012); 2) the introduction of additional safety measures such anti-HBc screening and universal leukoreduction (2013) applicable to every HBB processing blood components; 3) the release of software requirement specifications for a HBB management system (2014); and 4) the progressive development of a national haemovigilance programme (as of 2015), that comprises a national blood donor questionnaire, the definition of blood donor selection criteria, the release of pre- and post-donation information leaflets, the setup of a transfusion related adverse reaction notification form and of donors' adverse reactions reporting form. These documents are released on the MoPH website but HBBs are not yet inspected (22).

On June 14, 2016, the first national campaign for the promotion of VNRD was launched at ESA location in the presence of the MoPH and the media. The campaign was disseminated in three languages (French, English and Arabic) through video TV ads, radio, billboards and posters. A hotline number "1214" was also settled to direct motivated donors towards the nearest blood centres.

The MoPH is well aware that those actions were not sufficient to meet the WHO's goals regarding 100% VNRD. It aims at further elaborating strategies for strengthening applicable laws and organizing orientation/educational sessions for HBB professionals. The MoPH is now considering implementing a national certification programme for blood transfusion centres and a national procedure/network transportation system for blood products, despite political and economic struggles.

Road blocks to achieving 100% voluntary blood donation

All stakeholders met to reflect on blood donation and collection in Lebanon, and taking into consideration peace and wartime, and identified a number of roadblocks preventing a safe and sustainable inventory, as follows:

1) Culturally, the Lebanese expect some form of benefit from donating blood and more specifically if the patient is outside their family and friend or relative circles. One of their commonest replies when asked to donate blood is “What’s in it for me?”

2) Donating is costly and time consuming because of frequent traffic jams in the city and the remoteness of the HBBs, which in addition do not operate after hours when traffic has eased. Donors would thus need or request time off just to donate. Moreover, free-of-charge parking and the post-donation canteen are not available in all HBBs.

3) Blood transfusion is not considered a public health issue; hence, a strict control, supervision, and inspection by Lebanese national authorities is lacking. The government may consider delegating to organizations such as the Lebanese Red Cross while providing financial support and overseeing their activities.

4) There are still Lebanese not aware about when and how to donate voluntarily, which calls for widespread information campaigns. It will also help to dispel some of the misconceptions regarding blood donation such as fears of harm to their health (ranging from fear of needles to loss of virility in males) or that receiving blood from family members or friends is safer and will eliminate the risk of transfusion-transmissible infection.

5) Laboratory workers do not possess a sufficient understanding of the psychology of people in order to attract and retain volunteer blood donors; they need specific education on how to improve their personal skills.

6) Staffing also poses a problem that range from a mild deficit in HBB technologists to the complete absence of donor recruiters. The latter must be enthusiastic and competent, not necessarily from medical or HBB background, but possesses an ability to lead and persuade. However, such positions are often not regarded highly by administrators nor have financial incentives/salaries. In fact, these are seen as a waste of resources and attention is often directed towards buying sophisticated technical equipment rather than upgrading and adequately staffing a donor system. Other difficulty related to staffing is that most laboratory and HBB directors are not adequately trained in transfusion medicine and only a few had direct

experience or training in blood donor recruitment. Much more effort needs to be directed to ensure that HBB directors are fully informed on different methods of donor recruitment and motivation.

Concluding perspectives

- MoPH should focus on performing regular inspections/audits regarding the implementation of all available national guidelines, and especially those which might affect the experience and retention of donors such as good practice for phlebotomy and blood donor selection criteria.
- A need for a blood supply committee under the auspices of the MoPH that would reunify all stakeholders in the blood transfusion and donation fields. Its mission would be (among others): 1) to provide an audit on the current situation; 2) to promote VNRD through campaign media and education; 3) to promote a successful network between LRC, NGOs, the Army and HBBs; 4) to elaborate preparedness plans for emergency situations; 5) to approach ethical issues related to donors and donations; 6) to implement a national data system management and to make possible the establishment of a national blood donor card; 7) to develop regular blood drives; and 8) to support scientific forums and seminars and education initiatives on blood donation and supply.
- Further roles for MoPH have been proposed, including the Ministry allocating adequate resources to this blood supply committee. MoPH should also be further engaged in the improvement process of transfusion activities in general, and transfusion medicine should be declared by law as a public health issue and should be considered a national priority for patient safety especially in critical situations.

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