ORIGINAL ARTICLE

# Analysis of blood donor deferral in Jeddah, Saudi Arabia: Characteristics and causes

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## Abstract

**Objective:** To analyse the rates and reasons for donor deferral at a blood bank in Saudi Arabia.

**Methods:** This retrospective study was conducted at King Abdulaziz Medical City, Jeddah, Saudi Arabia, and comprised data of all blood donors reporting for donation from January 2011 to December 2014 in the hospital's blood bank, accredited by the American Association of Blood Banks. Data was collected from the records maintained by the blood bank.

**Results:** Out of the 46,370 blood donors, 4,035(8.7%) were deferred. Of them, 764(19%) were deferred because of persistent high pulse rate, 689(17%) poor veins, 488(12%) low blood pressure and 74(1.8%) because of low haemoglobin.

**Conclusion:** Reasons for deferral may vary due to difference in socio-economic status, and cultural and environmental factors.

**Keywords:** Deferral, Blood donors, Saudi Arabia. (JPMA 66: 1392; 2016)

## Introduction

In Saudi Arabia, most blood banks and transfusion services are hospital-based, and the primary source of blood and blood products are family replacements with variable contribution from voluntary and community-based donations. At King Abdulaziz Medical City, Jeddah, Saudi Arabia, a large tertiary hospital, patient relatives and friends contribute to 70% of blood procurement while voluntary and community-based donation through mobile donor drives contribute to 30% of the donations.

In an effort to ensure adequate, sustainable and safe blood supply, it is crucial not only to increase the number of donations, but also to target donors meeting standard eligibility criteria and avoid those with risk, identified through the health questionnaire , who should be deferred either temporarily or permanently.[1] Donor eligibility policies are a critical layer of blood safety designed to protect donors as well as recipients.[2,3] The risk of transfusion safety threats varies by donation history (first-time vs. repeat) and type of donation (voluntary vs. replacement). Repeat and voluntary donors are considered to be safer donors.[4,5] Eligibility criteria also vary between countries and across regions due to differences in prevalence in transfusion-transmitted infection as well as ethical and cultural factors.[6]

In Saudi Arabia, little is known about donor deferral, including the characteristics, rates and regional variability of the deferrals between blood banks. Tattooing or body piercing is uncommon but blood-letting or Hijama is widely practised in the region, including Saudi Arabia. However, there is no data available if different blood banks in the Kingdom are deferring donors due to blood-letting and if so what is the deferral rate.[7]

Saudi studies about donor deferral rates, deferred donor characteristics and reasons for deferral are scarce. The current study was planned to evaluate temporary and permanent deferral rates and reasons. The current study was planned to help clarify the extent of donor deferrals and to provide data to increase donations through scientifically and socially acceptable practices.

## Materials and Methods

This retrospective study was conducted at King Abdulaziz Medical City, Jeddah, Saudi Arabia, and comprised all blood donors reporting from January 2011 to December 2014 for donation in the hospital's blood bank, accredited by the American Association of Blood Banks (AABB). Blood donors were evaluated on the basis of donor history questionnaire, physical examination, haemoglobin (Hb) estimation, pulse rate, blood pressure (BP) and temperature. AABB and blood bank guidelines were used for selection and deferral of

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blood donors.[8]

All donors had been provided with educational material that described the donation process and were requested not to donate if they were at risk of infection with blood-borne pathogen. Donors were questioned, inconfidence, about specific risk behaviour, travel history and other factors that potentially affect donor or recipient safety. For issues that were not covered by the standards and national guidelines, the blood bank medical director was responsible for determining donor eligibility. Informed consent had been obtained from all donors. Data was collected from the records maintained by the blood bank. Each donor was provided with special contact number to call after donation if he/she would like the Centre to withdraw the donated blood/ product inconfidence.

## Results

Out of the 46,370 people who had come for blood donation, family/friends replacement donors constituted 31,995 (69%) and voluntary donors were 14,375 (31%) (Table-1). Besides, there were 46,139(99.5%) men and 231(0.5%) women among the donors. Moreover, 4,035(8.7%) cases were deferred. Of them, 764(19%) were deferred because of high pulse rate, 689(17%) poor veins, 488(12%) low BP, 294(7.3%) Hijama and 74(1.8%) because of low haemoglobin (Table-2).

**Table-1:** Types of blood donors.

| Type of donors | Number ( % ) |
|---|---|
| Replacement | 31,995 (69% ) |
| Volunteer donors | 14,375 (31%) |
| Total | 46, 370 (100%) |

**Table-2:** The reasons of all pre-donation deferral.

| Deferral Category | Number (%) |
|---|---|
| High pulse rate (persistent) | 764 (19) |
| Poor veins | 689 (17) |
| Low blood pressure | 488 (12) |
| Self deferral | 351 (8.7) |
| Hijama | 294 (7.3) |
| Inadequate sleep | 250 (6) |
| Low pulse rate | 223 (5.5) |
| Illness (recent or concurrent) | 198 (4.9) |
| Skin lesion(s) | 197 (4.9) |
| Medication(s) | 115 (2.8) |
| High blood pressure | 87 (2.1) |
| Previously deferred | 78 (1.9) |
| Low Hb | 74 (1.8) |
| Under weight | 39 (0.9) |
| High temperature | 22 (0.5) |
| High Hb | 19 (0.4) |
| Others | 147 (3.6) |
| Total | 4,035 (100) |

Hb: Haemoglobin.

**Table-3:** Comparison of deferral rates and the most common reasons for deferral in our study, with other studies.

| Study | Deferral rate | Most common three reasons for deferral |
|---|---|---|
| Our study (King Abdulaziz Medical City, Saudi Arabia) | 8.70% | High pulse rate<br>Poor veins<br>Low blood pressure |
| Singapore 1993[12] | 14.40% | Medications<br>Illness (flu)<br>Low haemoglobin |
| United States 2004[13] | 13.60% | Low haemoglobin<br>Emigration from malaria endemic zone<br>Tattoo or needle exposure |
| Turkey 2007[14] | 14.60% | Low haematocrit<br>Illness (common cold)<br>High-risk sexual activity |
| Nigeria 2014[15] | 16% | Low haemoglobin<br>High blood pressure<br>Under weight |

## Discussion

Millions of blood and blood products are transfused each year globally. In the United States, over 30 million blood components are transfused each year.[9] Blood and blood component donors are invaluable resource for any successful transfusion service. Donors are people of social concern who come to donate blood with altruistic intensions and hence consider themselves as healthy individuals. However, some donors may be unfit or unsuitable for donating blood. Therefore, it is the responsibility of the blood donor centres to identify unsuitable donors and defer them as appropriate either temporarily or permanently. However, frequent and unnecessary donor deferral (especially temporary deferment) may lead to loss of potential blood donors.[10,11]

Various studies have reported different rates of donor deferrals. These differences differ from one country to another and also from one blood centre to another, even within the same region. While some studies reported rates as low as 4-6%,[12,13] others have reported rates as high as 15-21%.[14-17] Some reports have cited donor deferral rates of up to 35.6%.[18] The differences in the deferral rates may probably be due to the differences in the donor population, donor type and donor selection criteria used

in different studies. Deferral cause at our blood centre were compared with other published reports (Table-3).

Low haemoglobin has been reported as a major cause of deferral in many studies reported from Japan,[19] India,[20] Pakistan,[21] Turkey,[14] Brazil[1] and Saudi Arabia.[22] However, in our study only 1.8% of deferred donors had low haemoglobin, and this may be due to the dietary habits of our donor population as meat, chicken and dairy products are usual component of consumed food, both in urban and rural parts of western region of Saudi Arabia.

In our study, the majority of the donors were deferred for high pulse rate (19%), poor vein (17%) and low blood pressure (12%). High pulse rate (11%) and low blood pressure (9.1%) have also been reported as major deferral causes.[22] Many donors, especially first-time donors, are usually nervous and anxious about donation, and although such individuals are given time to relax and reassured before taking second and third pulse reading, the rate often remains high. In our study, the 19% donor deferral due to high pulse rate is much higher than most published reports and is considered a matter of concern. It is important that further measures should be taken to calm down donors and minimise deferral due to high pulse rate through creating a friendly donor reception area, video-based donor education refreshment and effective interaction with the blood donation staff well ahead of donor interview. Donor deferral due to poor venous access was 17% in our study (Table-2). This is again an unusually high deferral cause. There are not many published studies that have described poor vein to be a major concern. Rehman S. et al.[23] have described a deferral rate of 0.2% due to poor or difficult veins. We reviewed our staff phlebotomy competency and assessed if further training was needed. As a policy, all donors with poor or difficult veins are checked by two phlebotomists before the donor is deferred. We observed that a major proportion of our donor population were well built with brawny arms. Whether less prominent veins are a genetic feature of our local male donor population is unclear. In order to improve and minimise donor deferral due to difficult venous access of otherwise perfectly healthy donors, we are in process of evaluation of a laser-based vein locator device, and we expect that the introduction of this vein-locator-methodology may improve on our phlebotomy failure rates and aid to preserve precious donors.

In our study, 7.3% donors were deferred for Hijama and 6% for having inadequate sleep. These two causes constituted 13.3% of our total deferral and were unique to our deferral reasons. There are not many published reports on these two conditions as an important deferral cause. Hijama is widely practised in many countries in the Gulf region, including Saudi Arabia.[7] Donors who had Hijama were deferred for 12 months period, similar to deferral for tattoo / body piercing. At our donor centre, we specifically asked all the donors if they had an adequate night sleep. Deferral due to lack of sleep perhaps reflects the late night sleep pattern in our general population.[24]

## Conclusion

Although donor deferral rates can be similar in different populations, the reasons for deferral may vary, perhaps reflecting difference in socio-economic status, and cultural and environmental factors. Some simple interventional pre-donations measures may reduce the deferral rate due to anxiety or difficult venous access. Analysis of deferral patterns may help medical personnel and blood bankers to be more focused in donor screening, especially of those causes occurring at higher frequency. Temporary deferred donors require proper follow-up and corrective actions management to minimise loss of valuable blood donors.

**Disclaimer:** This work has not been published before.

**Conflict of Interest:** None.

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