Donation history and vasovagal reactions in English whole blood donors: associations and mechanisms

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Background

Blood donation is safe, but 0.1-7% of donations cause vasovagal reactions (VVRs; feeling faint or fainting), which can harm donor health and discourage return.[1] First-time donors and donors with VVR histories are at greater risk,[1] but mechanisms behind this are unclear.

We hypothesised that decreasing negative psychologic responses to donation over multiple harmless experiences[2] and increasing responses following harmful experiences[3] (such as VVRs) could explain links between donation history and subsequent VVRs.

Therefore, we examined how much of VVR disparities by [1] donor career length, [2] donation frequency, and [3] VVR history operate independently of and via venipuncture pain and donation anxiety.

Methods

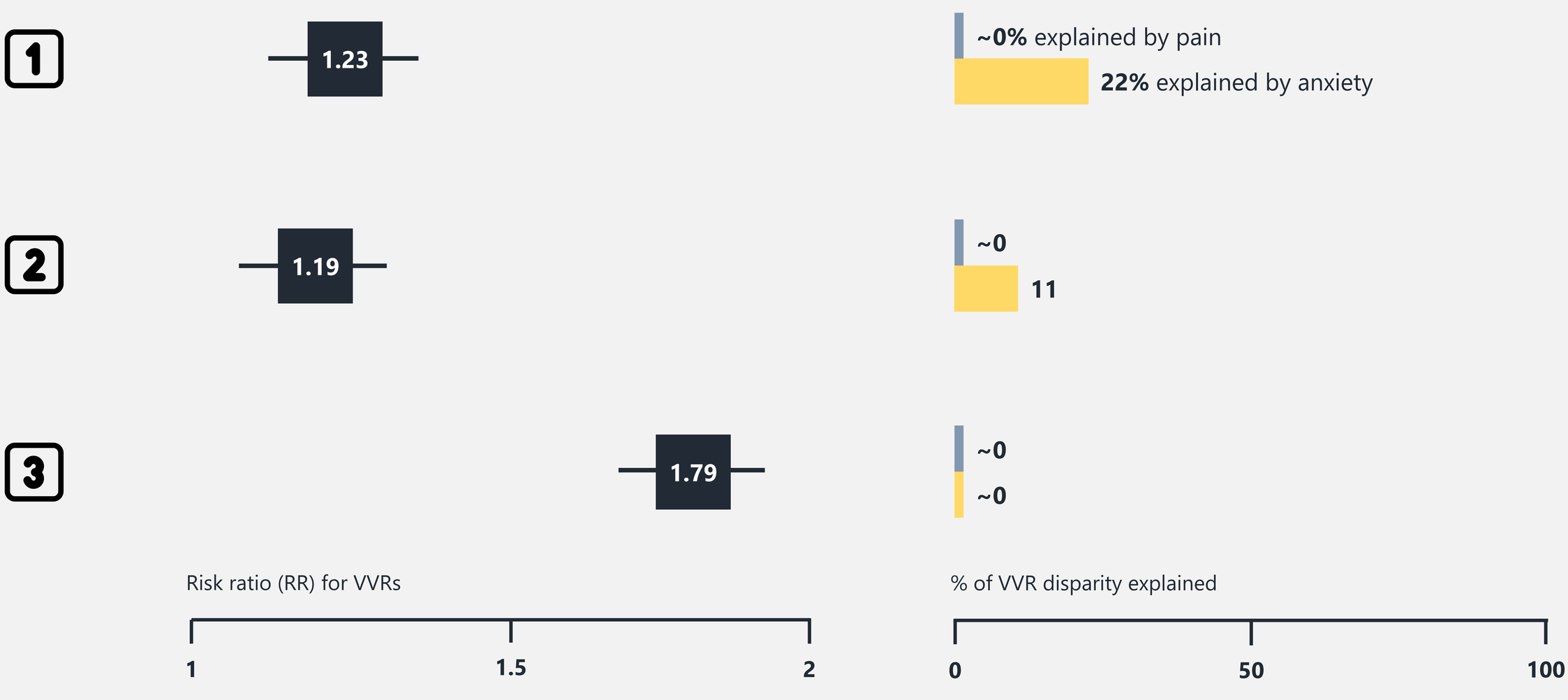
In English whole blood donors recruited from 2019-2022 into the STRIDES BioResource,[4] we used NHSBT records to measure:

[1] donor career length (< vs ≥ 2y prior to baseline; N = 56K),
[2] donation frequency (< vs ≥ median in past 2y; N = 45K), and
[3] VVR history (≥1 vs 0 VVRs in past 5y; N = 58K).

We measured donor-recalled VVRs, venipuncture pain, and donation anxiety ≥1 week post-donation via online questionnaires.

We fit multivariable binary outcome models to produce risk ratios (RRs) associating [1], [2], and [3] with pain, anxiety, and VVRs and calculated % of VVR disparities operating via pain and anxiety.[5]

[1] Inexperienced, [2] infrequent, and [3] previously reacting donors are at higher VVR risk. Venipuncture pain explains none, while donation anxiety explains little, of these differences.



Interpretation

Donation anxiety may evolve with accumulating donation experience, but this impacts little upon VVR disparities across donors' career length, donation frequency, and VVR history. Changes in physiologic responses to donation (e.g., heart rate) and/or uptake of preventative strategies (e.g., hydration) could also contribute to these disparities.

Our findings motivate increased vigilance for VVRs in infrequent donors in addition to known vulnerable groups of inexperienced and previously reacting donors. Longitudinal donor studies with repeated psychologic and physiologic measures are needed to quantify changing VVR risk throughout donor careers and ascertain its causes.

References

🔗 yaning-wu.github.io/files/bbts-2024-refs.pdf

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