

Case Studies of Incidental Finding of Secondary Polycythaemia due to Hookah Pipe Use in Regular Blood Donors at the Western Cape Blood Service, South Africa

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Background

- Donors undergo pre-donation haemoglobin (Hb) screening using a Hemocue® device

	Normal Hb Range for Gender	WCBS Minimum Cut-Off
ADULT MALE	13.5 - 16.7 g/dl*	13.5 g/dl
ADULT FEMALE	11.7 - 14.9 g/dl*	12.5 g/dl

* Reference ranges obtained from local donor population study

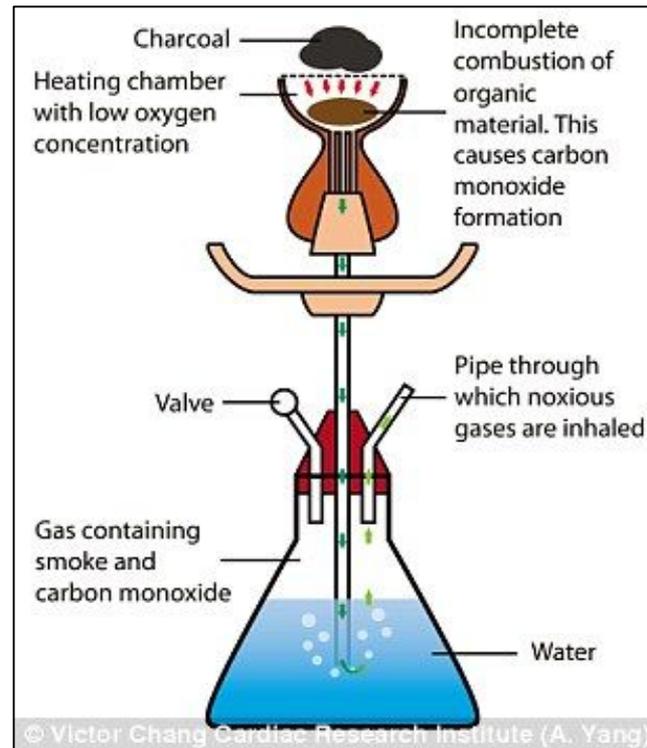
- Donors with low values are offered a full blood count test
- Donors with high values are flagged for attention by the Specialised Donations Department and followed-up
- Five donors with high Hb values who smoked hookah pipes were identified

Hookah Use

- Also known as ‘shisha’ or ‘hubbly-bubbly’
- Originated in India and the Middle East and has gained global popularity
- More socially accepted than cigarette use¹ and health effects less researched^{1,2}
- Smoke is inhaled through water which is **inaccurately** thought to minimise the tobacco-related hazards



Hookah Use



What are the dangers of hookah use?

- Hookah smoke contains toxic compounds such as nicotine, carbon monoxide and formaldehyde¹
- Significant associations with lung cancer, respiratory illness, low birth-weight and gum disease²
- Length of smoking time typically longer than cigarette use to reach equivalent nicotine 'high'³
- Carbon monoxide levels higher in hookah smoking than cigarettes³
- Cigarette and hookah pipe usage result in decreased oxygen delivery to the lungs, which stimulates production of red cells in the bone marrow (polycythaemia)

What is polycythaemia?

- This refers to an **increased concentration of red cells** in the blood
 - Results in raised haemoglobin and haematocrit (percentage of red cells in the blood) values
- This causes the blood to become ‘thicker’ and can predispose to thrombotic complications, such as heart attacks and strokes
- Causes include polycythaemia vera (bone marrow cancer diagnosed by JAK-2 testing), smoking, testosterone use, chronic lung and heart conditions, sleep apnoea and living at high altitudes



Case Studies

Cases	Age	Gender	Hemocue	Haemoglobin (g/dL)	Haematocrit (%)	Follow-Up with Own Doctor	JAK-2 Testing	Outcome
NW	32	Male	20.0	21.3	63	Yes	Negative	Continues with regular donation and management by own doctor
RA	35	Male	21.3	21.5	63.3	Yes	Negative	Continues with regular donation and management by own doctor
NK	31	Male	23.1	21.9	65.2	No	Not performed	Has not followed up with his doctor
MH	26	Male	20.1	20.3	57.4	No	Not performed	Has not followed up with his doctor
SS	49	Male	21.4	19.7	60.1	Yes	Not performed	Continues with regular donation and management by his doctor

Male Hb range: 13.5 - 16.7 g/dl | Male Haematocrit range 45 - 52 %

Summary and Conclusion

- This study has highlighted how hookah pipe usage was associated with high haemoglobin screening results in several regular blood donors.
- Although the blood services should not be regarded as diagnostic or primary health screening sites, there is opportunity to identify health problems in donors.
- Hookah smoking should be enquired about in donors with marked polycythaemia.
- Hookah pipe usage has numerous health risks that are misunderstood by the general population.
- Further research into this practise is needed in the South African setting.

References

1. Blachman-Braun et al. Hookah, is it really harmless? *Respiratory Medicine* (2014) 108, 661-667
2. Akl et al. The effects of waterpipe tobacco smoking on health outcomes: a systematic review. *International Journal of Epidemiology* (2010); 39:834-857
3. Bou Fakhreddine et al. The growing epidemic of water pipe smoking: Health effects and future needs. *Respiratory Medicine* (2014) 108, 1241-1253

