HAEMATOLOGICAL AND INFLAMMATORY BIOMARKER RESPONSES TO KHAYA SENEGALENSIS AND CARICA PAPAYA EXTRACTS IN INDIVIDUALS WITH SICKLE CELL DISEASE

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SCD, VOC & BIOMARKER CONTEXT

Vaso-occlusive crisis is a major acute complication of SCD. Sickled erythrocytes, activated leukocytes, platelets and endothelium contribute to microvascular obstruction, tissue ischaemia, inflammation and pain.

Sickling → Occlusion → Ischaemia → Inflammation

BIOMARKER RATIONALE

↓ PCV ↑ WBC ↑ IL-6 / TNF-α

↑ bilirubin organ indices: variable

STUDY DESIGN

- Longitudinal interventional study
- 40 individuals with SCD + 10 HbAA controls
- Age 10-40 years; five centres in South-West Nigeria
- Four SCD groups (n=10 each): KS; CP; KS:CP 1:2; KS:CP 2:1
- 5 g extract daily for 4 weeks
- Pre/post: PCV, WBC, platelets, differential counts, IgG, IL-6, TNF-alpha and biochemical indices

INTERPRETATION

Responses were not uniform across groups. PCV increased significantly with KS and KS:CP 1:2, but not with CP or KS:CP 2:1. WBC decreased significantly with KS, CP and KS:CP 1:2, while it increased in KS:CP 2:1. IL-6 decreased significantly in KS, CP and KS:CP 2:1, but not in KS:CP 1:2. TNF-alpha decreased significantly in all four groups.

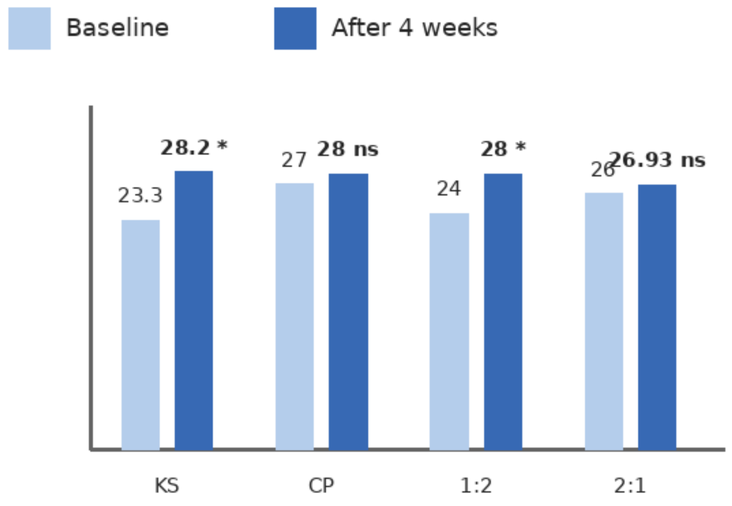
CONCLUSION

The extracts were associated with significant changes in selected haematological and inflammatory biomarkers. Response patterns varied across groups. Larger controlled studies with standardised extracts and longer-term safety assessment are required.

KS: Khaya senegalensis CP: Carica papaya PCV: packed cell volume WBC

PACKED CELL VOLUME (PCV)

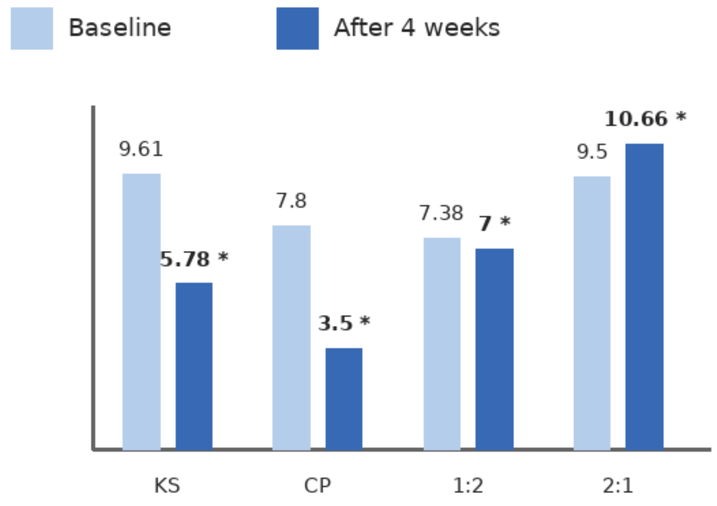
%



* p<0.05; ns = not significant. Values are mean ± SD.

WHITE BLOOD CELL COUNT

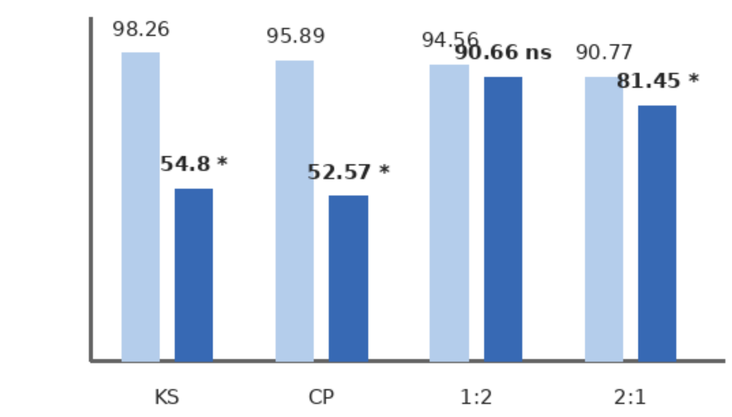
×10⁹/L



* p<0.05; ns = not significant. Values are mean ± SD.

INTERLEUKIN-6 (IL-6)

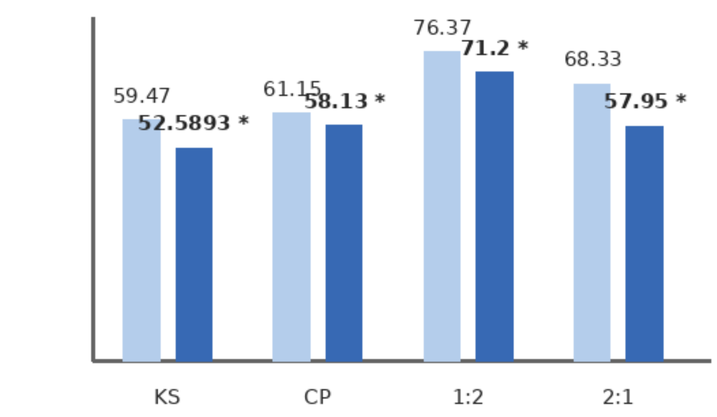
pg/mL



* p<0.05; ns = not significant. Values are mean ± SD.

TNF-ALPHA

pg/mL



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KEY HAEMATOLOGICAL AND INFLAMMATORY RESULTS

Group	PCV %	WBC ×10⁹/L	IL-6 pg/mL	TNF-α pg/mL
KS	23.3→28.2 p=0.000	9.61→5.78 p=0.000	98.26→54.8 p=0.001	59.47→52.5893 p=0.001
CP	27→28 p=0.225	7.8→3.5 p=0.005	95.89→52.57 p=0.000	61.15→58.13 p=0.022
KS:CP 1:2	24→28 p=0.008	7.38→7 p=0.003	94.56→90.66 p=0.300	76.37→71.2 p=0.044
KS:CP 2:1	26→26.93 p=0.215	9.5→10.66 p=0.000	90.77→81.45 p=0.000	68.33→57.95 p=0.000

TAKE-HOME MESSAGE

Selected biomarker changes support further investigation of K. senegalensis and C. papaya in SCD. The observed biomarker changes are encouraging, but larger controlled clinical studies are required to determine therapeutic efficacy. Extract standardisation, clinically meaningful endpoints and long-term safety monitoring are also needed.

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