Joint Meeting of Coronary Revascularization
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Potential application of a benchtop flow cytometer in the management of patients requiring percutaneous coronary intervention

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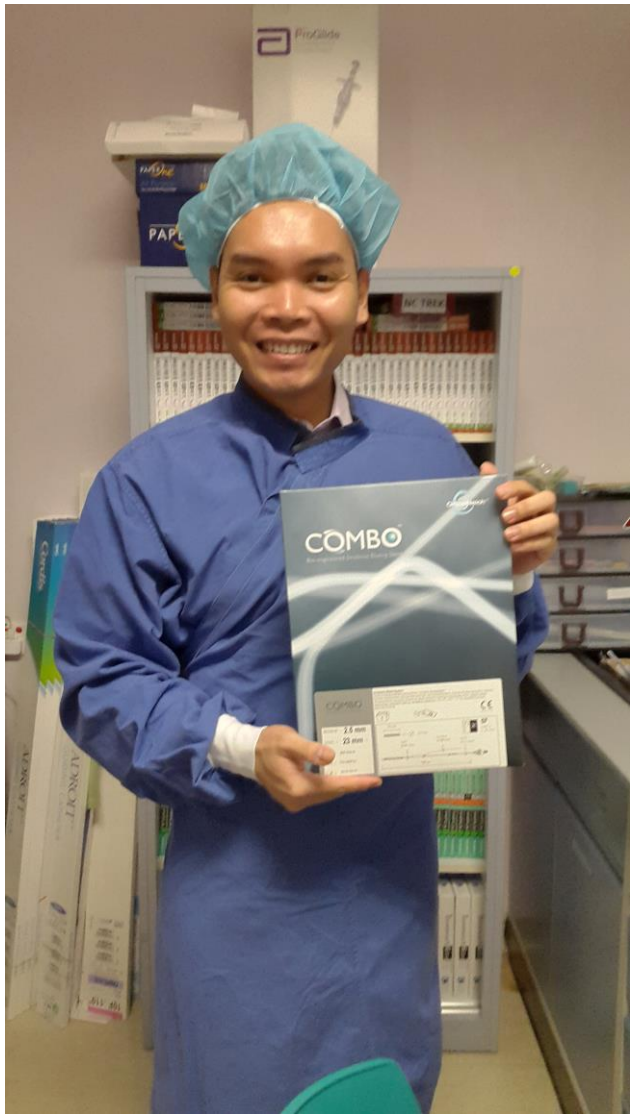

COMBO

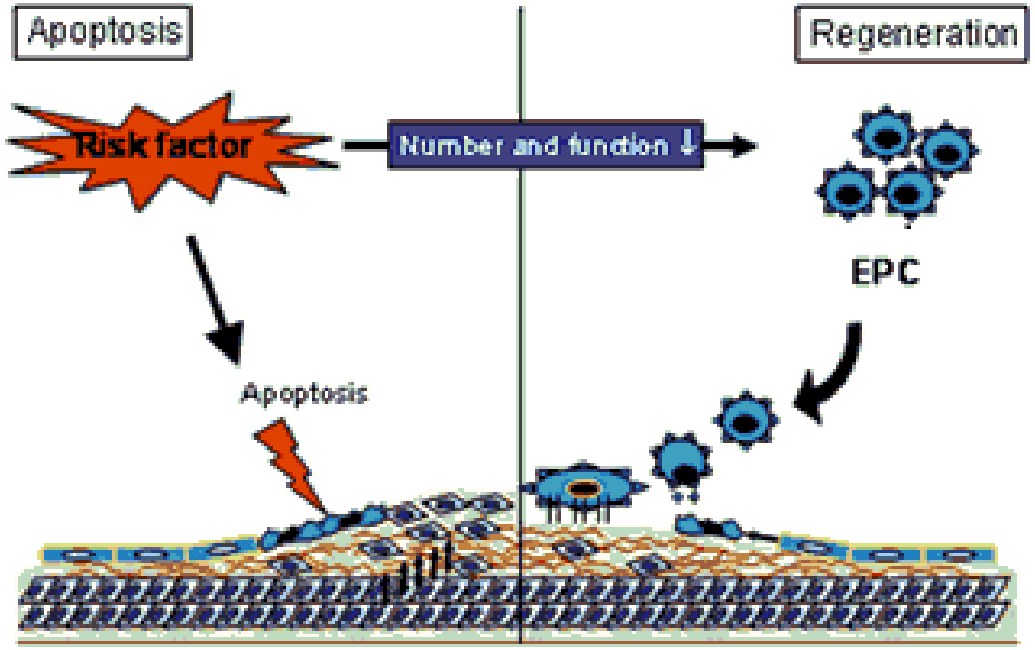
INTRODUCTION

- EPC captured technology (patented technology under OrbusNeich).
- enhance EC coverage and maturation of ECs on drug-eluting stents
- Older generation manifest early stent restenosis and late stent thrombosis

- Contain abluminal sirolimus together with anti-CD34.
- hematopoietic progenitor cell antigens CD34
- peripheral blood of normal individual →0.01-0.05%
- Bone marrow → constitutes 3% of the cells

accumulate in ischemic injured tissues and repair

therapeutic potential in arterial disease (PAD) and coronary artery syndrome (ACS).

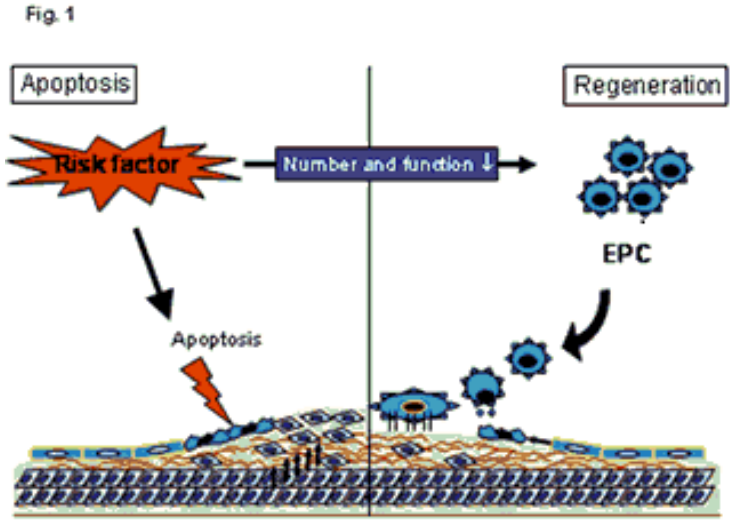


Measures multiple characteristic in a single fluidic system

analyzing expression of cell surface and intracellular molecules, characterizing and defining cell types

smaller, less expensive and continuously increased in clinical laboratory applications.

RATIONALE



The role of a benchtop flow cytometer in the management of patients undergoing PCI has not yet been established.

OBJECTIVE

To explore the potential application of a benchtop automated flow cytometer (C6; Becton & Dickenson) in the management of patients undergoing PCI. To ascertain the absolute number of CD34+/KDR+ EPC cells in patients undergoing PCI.

CASE 1

- 54 years old, Female
- History of ACS
- CV risk factor- HTN
- Diagnosis on admission- Stable angina

CASE 2

- 54 years old, Male
- No previous history to ACS
- CV risk factor- NONE
- Diagnosis on admission- ST-elevation myocardial infarction

Methodology

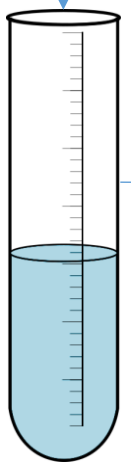
Blood Collection
-5ml in K3 EDTA Vacutainer
-Obtained post-PCI

20ul of CD34 FITC/KDR PE

100ul of blood

Vortex, Incubate at ^{o}4C in the dark for 20 mins

Add 1ml lysing solution
-Incubate 15 mins in the dark at ^{o}4C



Washed with PBS

Dilute

Analyze sample
Within 1 hr after lyse

Case 1: Angiogram findings

- single vessel coronary artery disease
- RCA- 90-95% stenosis at the mid-segment
- A COMBO (Orbus Neich Medical) 3.5x15mm bioengineered-EPC capture stent was successfully deployed in the proximal right coronary artery

Case 2: Angiogram findings

- double vessel coronary artery disease
- LAD- 80% Stenosis at prox. Segment
- RCA- Long, diffuse stenosis, up to 90% stenosis at the mid-segment.
- An Orsiro (Biotronik AG) drug eluting stent was successfully deployed in the proximal left anterior descending artery

Flow Cytometric Findings

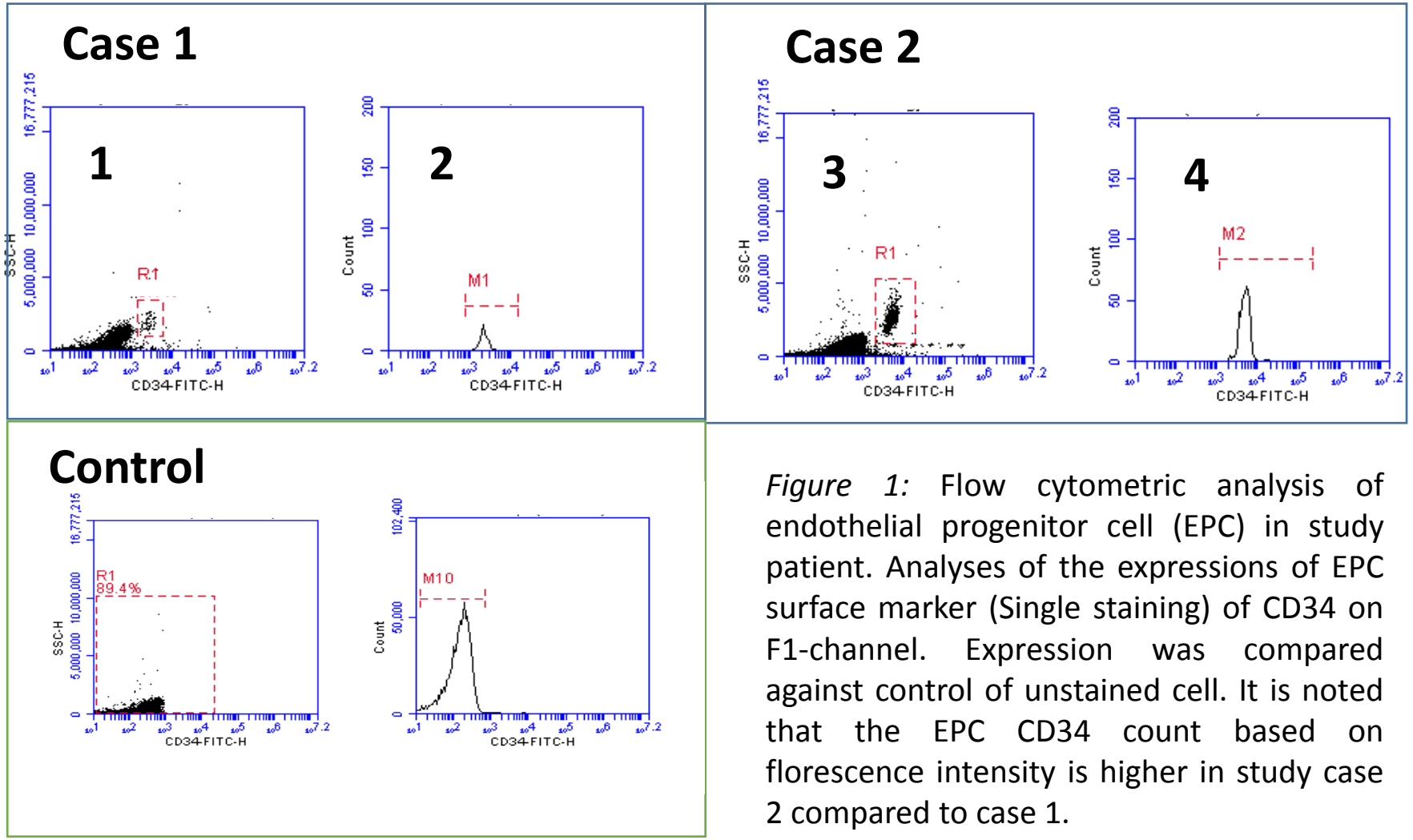


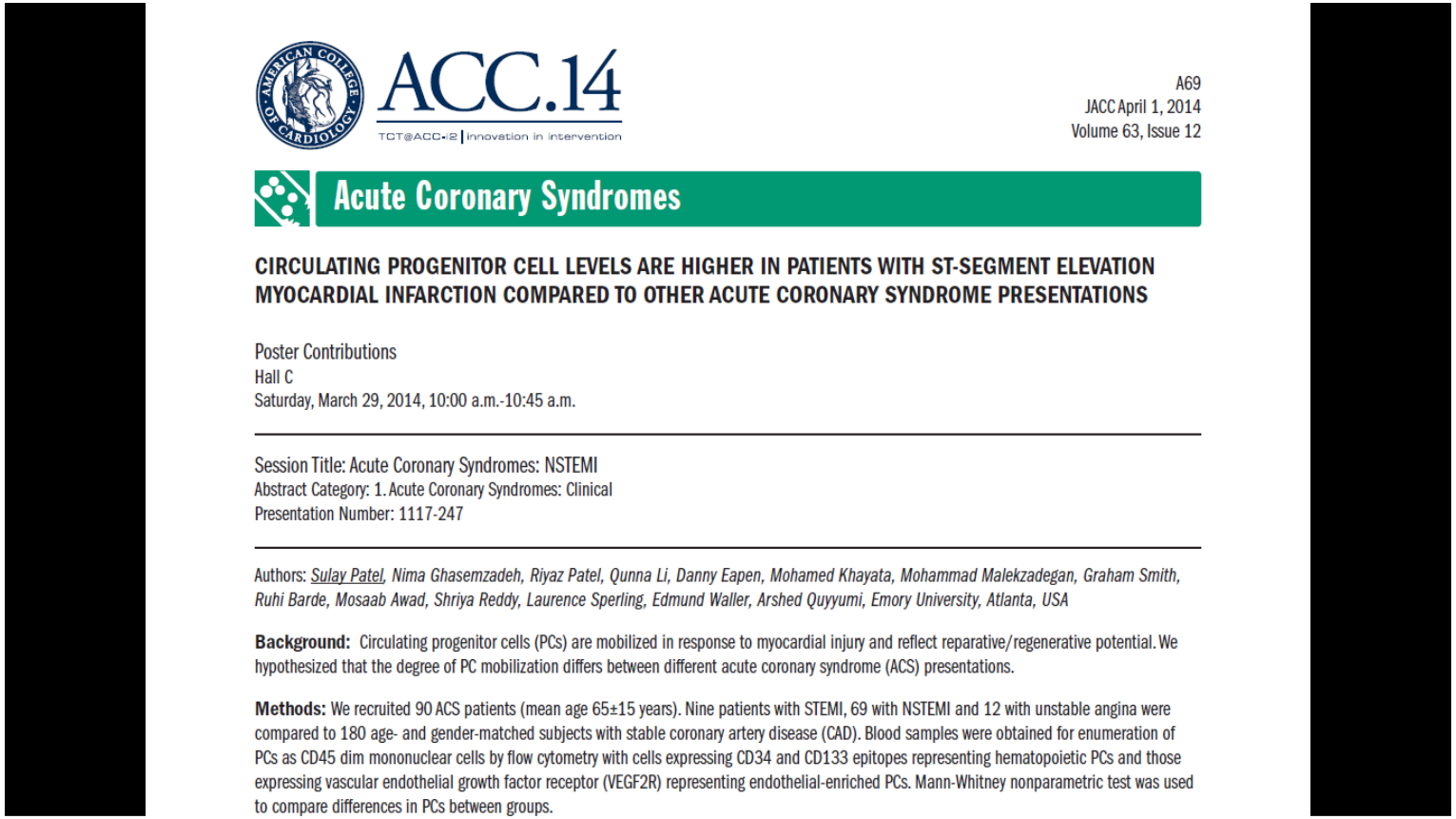
Figure 1: Flow cytometric analysis of endothelial progenitor cell (EPC) in study patient. Analyses of the expressions of EPC surface marker (Single staining) of CD34 on F1-channel. Expression was compared against control of unstained cell. It is noted that the EPC CD34 count based on florescence intensity is higher in study case 2 compared to case 1.

Summary

Case 2- STEMI→ **higher** EPC CD34 counts

Case 1-Stable angina→ **lower** EPC CD34 counts

Summary



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Acute Coronary Syndromes

CIRCULATING PROGENITOR CELL LEVELS ARE HIGHER IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION COMPARED TO OTHER ACUTE CORONARY SYNDROME PRESENTATIONS

Poster Contributions
Hall C
Saturday, March 29, 2014, 10:00 a.m.-10:45 a.m.

Session Title: Acute Coronary Syndromes: NSTEMI
Abstract Category: 1. Acute Coronary Syndromes: Clinical
Presentation Number: 1117-247

Authors: *Sulay Patel, Nima Ghasemzadeh, Riyaz Patel, Qunna Li, Danny Eapen, Mohamed Khayata, Mohammad Malekzadegan, Graham Smith, Ruhi Barde, Mosaab Awad, Shriya Reddy, Laurence Sperling, Edmund Waller, Arshed Quyyumi, Emory University, Atlanta, USA*

Background: Circulating progenitor cells (PCs) are mobilized in response to myocardial injury and reflect reparative/regenerative potential. We hypothesized that the degree of PC mobilization differs between different acute coronary syndrome (ACS) presentations.

Methods: We recruited 90 ACS patients (mean age 65±15 years). Nine patients with STEMI, 69 with NSTEMI and 12 with unstable angina were compared to 180 age- and gender-matched subjects with stable coronary artery disease (CAD). Blood samples were obtained for enumeration of PCs as CD45 dim mononuclear cells by flow cytometry with cells expressing CD34 and CD133 epitopes representing hematopoietic PCs and those expressing vascular endothelial growth factor receptor (VEGF2R) representing endothelial-enriched PCs. Mann-Whitney nonparametric test was used to compare differences in PCs between groups.

Conclusion

The measurement of CD34+ EPC cells can be rapidly performed with a benchtop flow cytometer in patients undergoing PCI

LIMITATION

-2 cases only

-Cell viability is not performed

Thank you