

Introduction

ICGA is a new imaging technology with the potential to change the way we monitor the angiogenic effects of hyperbaric oxygen therapy

- ICG is a fluorescent dye that is injected via a peripheral IV
- ICG binds to plasma proteins and is confined to the intravascular space
- Quantitative analysis can be done using Ingress and Egress of ICG

There are many variables that have not been fully evaluated with regard to testing protocols, so we undertook an evaluation process to identify potential confounding factors in the interpretation of ICGA

Methods

We evaluated the variability of ICGA by performing testing protocols investigating parameters of interest

- 2 subjects over different time points
- Different doses of ICG on the same subject at the same visit
- immediately before and after a hyperbaric oxygen treatment
- immediately before and after transcutaneous oximetry of the foot

Results

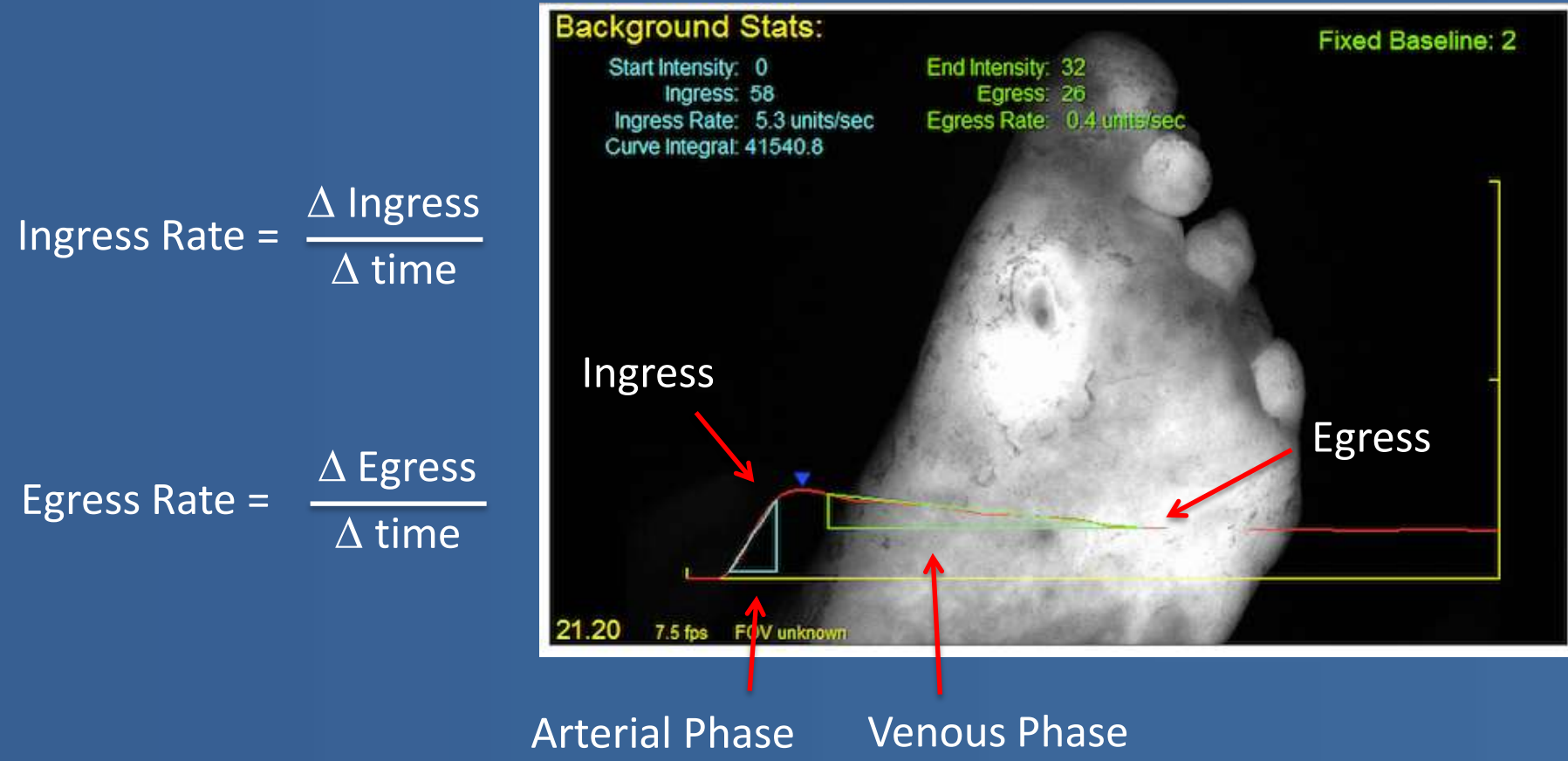
- There was minimal subjective and objective variability between studies of each subject
- ICG uptake was lower than expected in “normal” feet
- There was subjective and objective variability based on dose of ICG
- There was neither subjective nor objective variability after an acute hyperbaric oxygen treatment
- There was a subjective change in the image after transcutaneous oximetry, but no change in the objective measurement

Conclusions

Some test results were reproducible; however, we did see variability that raised concerns about how to interpret the repeated studies




- Lack of ICG ingress does not necessarily indicate ischemia
- ICG is drawn up for each study leading to potential dosing error
- A single hyperbaric oxygen session does not appear to have a demonstrable effect
- TCOM testing causes hyperemia in the site of the probe, which can be seen if ICGA is performed immediately afterwards

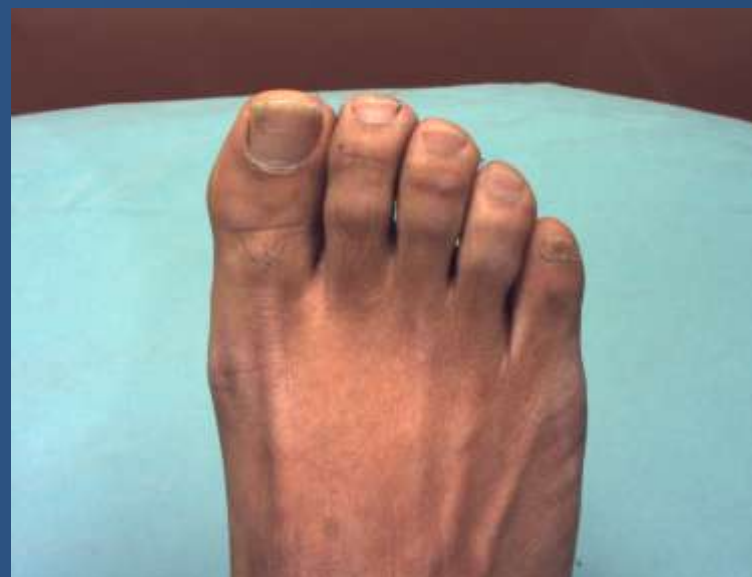



More rigorous studies need to be conducted to verify these results, including standardized testing protocols in order to avoid factitious results






- Intrepreting the Nmbers**
- **Ingress** represents the brightness of the image at the end of the arterial phase and is represented by a number from 0-255
 - **Ingress Rate** represents the increase in ICG per second, measured as units/second
 - **Egress** represents the brightness of the image at the end of the venous phase and is represented by a number from 0-255
 - **Egress Rate** represents the decrease in ICG per second, measured as units/second
 - **Curve Integral** measures the area under the curve

Reproducibility




| | | |
|---|---|---|
|  |  |  |
| Ingress | 51 | 44 |
| Ingress Rate | 1.2 | 0.7 |
| Egress | 6 | 1 |
| Egress Rate | 0.1 | 0 |
| Curve Integral | 50354.3 | 42210.4 |

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ingress | 27 | 27 | 31 |
| Ingress Rate | 0.2 | 0.2 | 0.3 |
| Egress | N/A | N/A | N/A |
| Egress Rate | N/A | N/A | N/A |
| Curve Integral | 17300.4 | 23903.4 | 26378.6 |



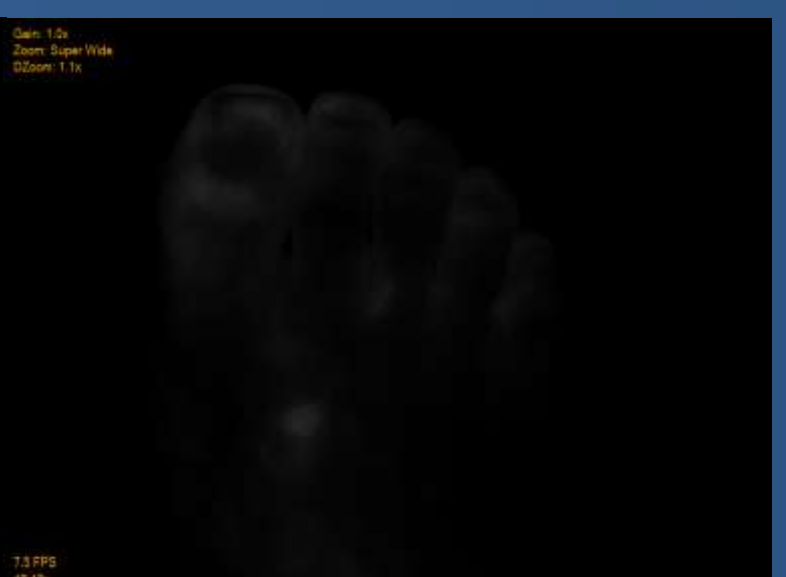
Dosing of ICG

| | | |
|---|---|---|
| | 2.0 cc ICG | 3.0 cc ICG |
|  |  |  |
| Ingress | 253 | 235 |
| Ingress Rate | 54.9 | 69.9 |
| Egress | 210 | 169 |
| Egress Rate | 6.5 | 1.6 |
| Curve Integral | 80391.0 | 137390.5 |

Hyperbaric Oxygen Treatment

| | | |
|---|---|---|
|  |  |  |
| Ingress | 233 | 221 |
| Ingress Rate | 24.2 | 24.1 |
| Egress | 156 | 155 |
| Egress Rate | 1.3 | 1.3 |
| Curve Integral | 149314.6 | 128006.6 |

Transcutaneous Oximetry

| | | |
|---|---|---|
|  |  |  |
| Ingress | 27 | 30 |
| Ingress Rate | 0.2 | 0.3 |
| Egress | N/A | N/A |
| Egress Rate | N/A | N/A |
| Curve Integral | 17300.4 | 26687.9 |

Examples of Reports

