



# Benefits of Ginger

Natural anti-bacterial

Anti-flatulence

Anti-inflammatory

May help fight

## GINGER FOR MANAGEMENT OF AIR SICKNESS

Anti-nausea

Energy-booster

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Simple ginger tea for common cold remedy: Boil 2 inches unpeeled ginger in 2 cups water for 10 minutes, covered. Let cool and sip with raw honey and organic lemon slices/juice

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# PLAN



- Introduction
- Need for the study
- Aim
- Methodology
- Results
- Discussion
- Conclusion
- Recommendations



# INTRODUCTION





# INTRODUCTION



- Air Sickness: Common problem affecting aircrew & passengers
- Variant of motion sickness
- Provoked by unfamiliar motion environment of flight
- Trainee pilots commonly affected



# INTRODUCTION



- 30 – 40% become airsick during 1<sup>st</sup> air experience
- Majority adapt adequately (3<sup>rd</sup> / 4<sup>th</sup> sortie)
- Managed by pharmacological & non pharmacological methods
- Most medications not usable in pilots



# INTRODUCTION



- New approach towards prevention & management
- *Zingiber officinale* (ginger root) with :-
  - Physical Exercise Therapy (PET)
  - Progressive Muscle Relaxation (PMR)



# NEED FOR THE STUDY



- Ginger: Extensive use in traditional Indian & Chinese systems of medicine
- Anti-emetic effects: Aromatic, carminative & absorbent properties
- Direct effect on GI tract
- Scant literature on use of ginger in air sickness



# AIM



To assess the effectiveness of orally administered ginger root powder as an adjunct to Air Sickness Desensitisation Therapy (ASDT)





# METHODOLOGY



- Study conducted at Aeromedical Training Centre of IAF (18 months)
- Subjects: Under-training pilots referred for air sickness desensitisation
- 21 age matched males (n = 21)
- Test group (n = 11) & Control group (n = 10)



# METHODOLOGY



- Air sickness desensitisation protocol:-
  - Yogic exercises
  - PET
  - PMR
  - Exposure to provocative stimulus (Barany Chair)
- **1g ginger root powder mixed with pulverised glucose 4h before exposure**



# METHODOLOGY



- Controls given only pulverised glucose
- 10 yogic exercises known to stabilise the vestibular system
- Allay anxiety, modulate ANS, enhance focus
- 20 minutes of PET (Set of 4 exercises) followed by PMR



# BARANY CHAIR EXPOSURE



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# BARANY CHAIR EXPOSURE



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# METHODOLOGY



- Subjective response to each provocative motion exposure assessed
- Motion Sickness Assessment Questionnaire (MSAQ)
  - GI
  - Central
  - Peripheral
  - Sopite-related
  - Overall scores



# PROTOCOL



INDEPENDENT VARIABLES																		
DAY	1		2		3		4		5		6		7		8		9	
RPM	5		7.5		10		12.5		15		17.5		20		22.5		25	
ROTATION	C W	CC W	C W	CC W	C W	CC W	C W	CC W	C W	CC W	C W	CC W	C W	CC W	C W	CC W	C W	CC W
INTERVENTION	GINGER / NO GINGER																	
DEPENDENT VARIABLE																		
MEASURE	MSAQ																	

**CW – Clockwise**

**CCW – Counter Clockwise**





# METHODOLOGY



- ANOVA
- General linear model
- Overall MSAQ scores analysed for:-
  - Interaction effects between the three independent variables
  - Effect on dependent variable





# RESULTS



- No significant interaction effect between
  - Time ( $\uparrow$ RPM)
  - Ginger / No Ginger
  - Time of day/ direction of rotation



# RESULTS



- **Effect of Time**
- MSAQ expected to  $\uparrow$  with increasing provocation
- However, no significant effect of **time** on MSAQ scores (  $\uparrow$  RPM)
- $F = 1.470$  ;  $p = 0.172$
- **ASDT alone is effective in air sickness desensitization**



# RESULTS



- **Effect of Morning/ Evening & clockwise / anticlockwise rotation**
- There was no significant effect of the direction of rotation / time of day
- $F = 0.968$  ;  $p = 0.338$



# RESULTS



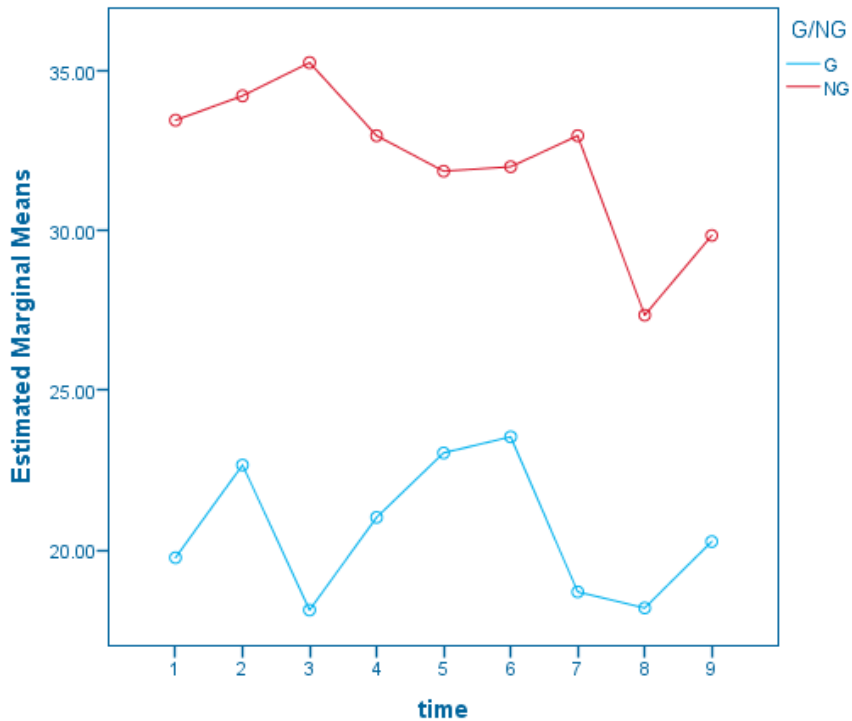
- **Effect of Ginger**
- The MSAQ changed significantly in the test subjects as compared to controls
- **$F = 6.6$  ;  $p = 0.019$**



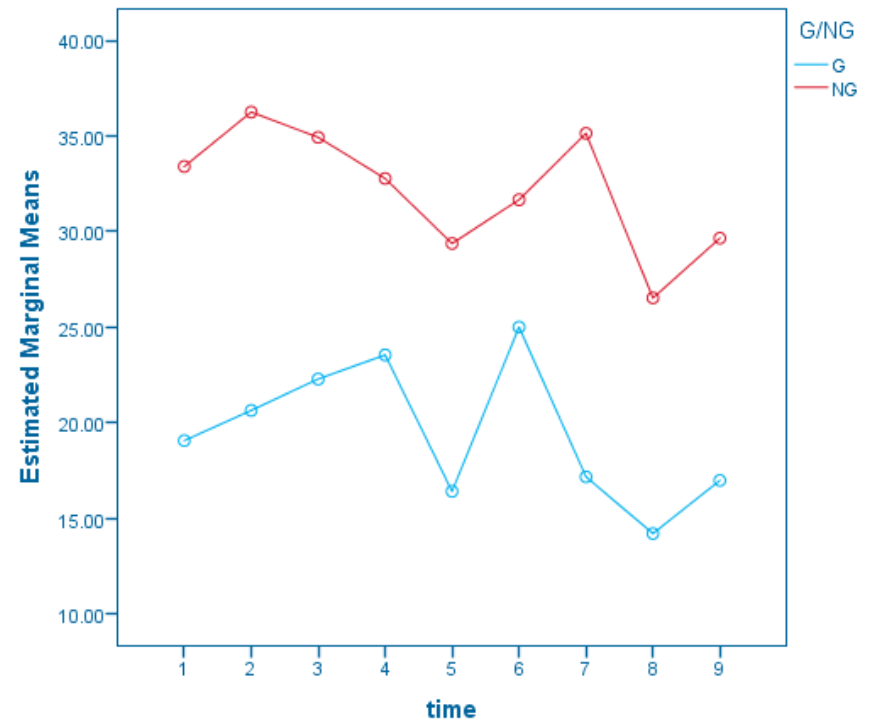
# RESULTS



## CLOCKWISE



## COUNTER-CLOCKWISE





# DISCUSSION



- Gingerol – 6: Active ingredient of ginger
- Also responsible for characteristic taste
- Exact mechanism of action unclear
- No significant adverse effects



# DISCUSSION



- Orally administered ginger root powder found to effectively ↓ severity of air sickness
- Results in agreement with some earlier studies
- Effective adjunct to ASDT
- Can be used safely by aircrew & passengers



# CONCLUSION



- Airsickness: Direct ramifications on flight safety & mission effectiveness
- Orally administered ginger root powder safe remedy
- Can be introduced as an adjunct to ASDT





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**THANK YOU!**

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