

Original Article

## Yogic Exercise as a prophylaxis to reduce airsickness and morbidity in ab-initio pilot trainees

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Air sickness is one of the common problems in aviation. Amongst ab-initio pilots its incidence is reported to be 30-40% in the first sortie. The incidence reduces in the 3rd and 4th sortie due to adaptability. However persistent airsickness merits intervention. Such cases were being referred to medical authorities when air sickness was florid and the ability to manage them at squadron level was limited. Such cadets were subjected to various non-pharmacological methods like Air Sickness Desensitisation (ASD) programme. This paper highlights the encouraging result with initiation of Yogic exercise schedule before the commencement of flying, outside the training time, as a prophylactic measure thereby saving flying hours and improving motivation.

**Keywords :** Air sickness desensitisation, Yoga exercise, Trainee pilots.

Air sickness is one of the common problems in aviation. Amongst ab-initio pilots its incidence is reported to be 30 to 40 % in the first sortie. The incidence reduces in 3rd and 4th sortie due to adaptability. However persistent air sickness requires medical intervention. Such cases are being referred to medical authorities after airsickness is florid. The ability to manage them at squadron level is limited. Such cadets are subjected to various non-pharmacological methods like Airsickness Desensitisation (ASD) programme. Yogic exercises have known beneficial effects on the human psyche and the autonomic nervous system. This paper highlights the encouraging results of initiation of a Yogic exercise schedule before the commencement of flying, as a prophylactic measure in the management of air sickness.

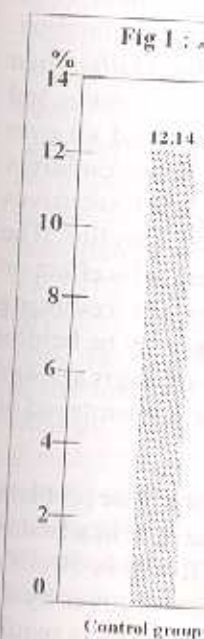
### Material and methods

Three pilot courses of ab-initio pilot trainees (133 males and 09 females, totaling 142) formed the experimental group and they were subjected to Yogic exercise schedule at Air Force Academy (AFA). Records of morbidity pattern including airsickness of three previous courses formed the control group (111 males and 29 females totaling 140) and were used for comparison. The subjects comprised of ex-NDA, direct entry and women cadets. The average age amongst the males was 21.5 years and female was 20.5 years. All were in full flying medical category i.e. A1 G1. Before commencement their consent to take part in the training program was taken. Psychometric and physiological parameters were recorded (vide infra). Parameters like EMG, ENG were not recorded due to poor co-relation.

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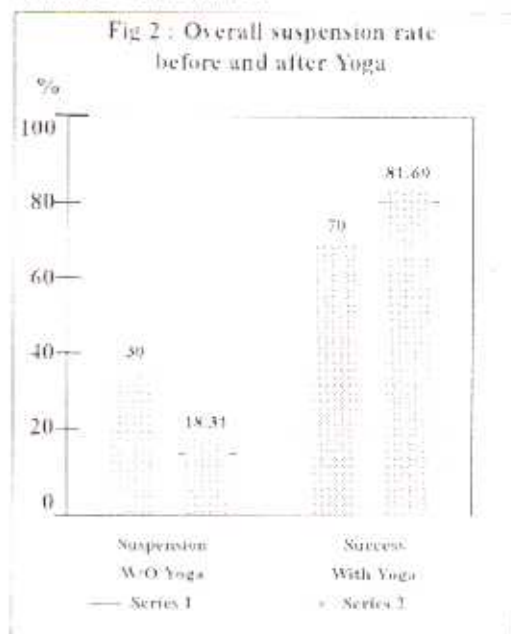
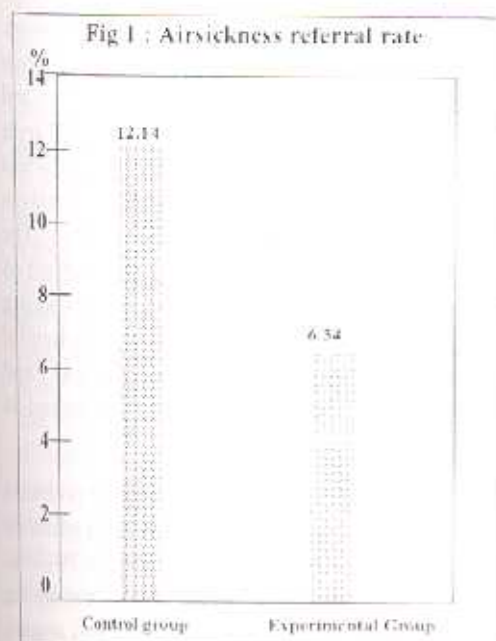
neck exercises), *Pramayama*, *Padmasana*, *Matsyandrasana*, *Kapal Bhati* and *Savasana* totaling 45 min. The exercises were commenced 3 to 4 weeks prior to start of stage I flying. It was conducted between 0600-0645 hours for the squadron flying in the afternoon and 1730-1815 hours for the squadron flying in the morning. The exercise schedule was maintained for an average of 3 days per week till end of stage-I flying in the first two courses. The schedule was reduced to 3 days fortnightly from the third course onwards. Heart Rate (HR) and Blood Pressure (BP) were recorded initially and then once in 15 days. At the end of 4 weeks a structured questionnaire was used to assess subjective feeling. Objective assessment was carried out by interviewing the instructors.

The case of airsickness that occurred in the experimental group were subjected to Physical Exercise Therapy (PET) as followed by Deshmukh et al [5].

Retrospective study on controls revealed that airsickness referrals in them were treated by PET but without prior yogic desensitisation. The airsickness and morbidity pattern in the two groups were compared. Collection of data on HR, BP and psychological parameters is continuing and not included for study in this paper.

### Results

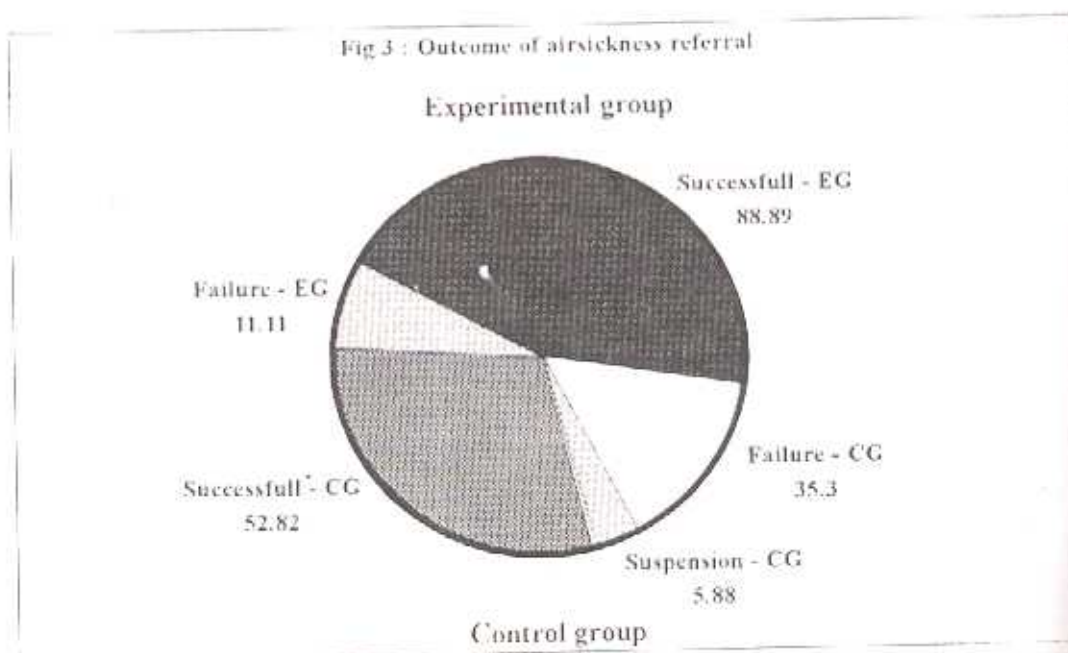
Airsickness referral in the experimental and control group were 9/14 (6.34%) and 17 (12.14%) respectively (Fig - 1) showing a reduction of 47.78% in the incidence of air sickness. Among the males the number of referrals were 13/111 (11.71%) and 8/133 (6.02%) in the experimental and control group respectively, a reduction of 48.59%. In the females the number was 1/9 (11.11%) and 4/29 (13.79%) in the experimental and control groups respectively. The reduction of airsickness referral among the females was 19.43%.





The overall number of suspensions in the experimental group were 26/142

(18.31%) and were 42/140 (30%) in the control group (Fig-2).



The overall success in the experimental group was 116/142 (81.69%) and in the control group was 98/140 (70%) (Fig-3). Amongst the airsickness cases failure was 1 (5.88%) in the control and nil (0%) in the experimental group. The cases who improved but failed to complete flying were 6 (35.30%) in the control and 1 (11.11%) in the experimental group and successful were 10 (58.82%) in the control and 8 (88.80%) in the experimental group (Fig - 3).

Non-traumatic morbidity was 92 (57.27%) in the control group and 54 (37.23%) in the experimental group. The reduction was 34.99%.

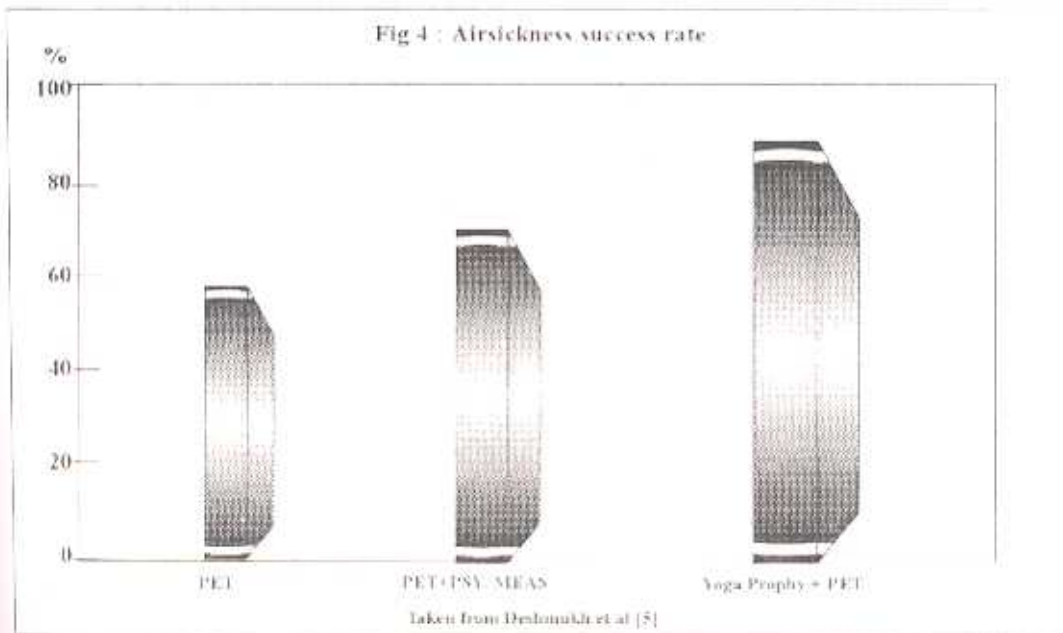
### Discussion

Yoga is an ancient Indian science which aims at maintaining good health, mental peace and

concentration. Among the divisions of Yoga *Raja yoga* is the yoga of inner concentration. A variant of Raja Yoga is the *Hatha Yoga* which gives the techniques of meditation and physical exercises. It is practiced all over the world and the various courses on Stress Management Technique for Executives (SMET) have been derived from this. The benefits of yoga may be due to its effect on autonomic nervous system reducing sympathetic activity. Yoga may be helpful in reducing the physiological and psychological problems encountered in flying.

Airsickness is one of the basic problems in aviation. The incidence of it in a first experience in training flying is 30-40%. However majority of them recover by the third or fourth sortie. Few cases is requir

Fig 4 : Airsickness success rate



referral for intervention. Reports of such referral were Dobie [1] 14.6%, Deshmukh [2] 12.5%; Rubin [3] and Hemmingway [4] 11%. In our study the incidence of referral was 12.14% (control group) before starting the yoga programme which is similar to that reported by Deshmukh [2] from the same center in an earlier study. However the incidence of such referrals has come down to 6.34% (experimental group) after initiation of prophylactic yoga. The overall reduction in the percentage of airsickness is 48.59%. Sex wise the incidence of airsickness referral before and after initiating yoga was 11.71% and 6.02% respectively in the males; 13.79% and 11.11% in the females. The reduction is more in the case of males than in females. Since the sample is small in females it requires further study on a larger sample. In the later part of this programme the cadets were made to do yoga 3 times in a fortnight as compared to 3 times

per week in the previous two courses. This resulted in an increased number of airsickness cases, up by 9.8%. This fact re-emphasises the value of prophylactic yoga therapy.

The number of suspensions on account of airsickness as reported by Deshmukh et al [5] were 7 (9.5%) in those who had undergone airsickness desensitisation programme based on Physical Exercise Therapy (PET) alone and 10 (11.01%) in those who had additionally undergone psychological measures. In our study the suspension was nil (0%) in the experimental group. However it requires further study on a larger number of cases. Similarly those who improved but failed to complete flying training due to other causes numbered 6 (35.30%) in the control and 01 (11.11%) with PET and 18 (19.8%) with PET and psychological measures in the study by Deshmukh et al [5]. Those case who



successfully completed flying training numbered 10 (58.82%) in the control group, which is close to 38 (52%) obtained by Deshmukh et al [5] with PET alone. The success rates obtained in various desensitisation programs as reported were Dobie [1] 67%; Bagshaw and Scott [6] 72%

Jones et al [7] 72%; Giles & Lockridge [8] 54%; Banks et al [9] 54.6% and Deshmukh et al [5] 69.2% (Table - 1). In our study the success rate after initiation of prophylotic yoga was 88.89% which is 22.13% more than that obtained by Deshmukh et al [5] in the same center previously with PET and

Table - 1 Comparison of Results of Airsickness Desensitization Programme

	RAF				USAF				CF		IAF			
	Dobie et al (1)		Bagshaw and Scott		Jones et al (7)		Giles and Lockridge (8)		Banks et al (9)		Deshmukh et al (5)		Kumar	
	1974-80		1979-85		1981-83		1979-85		1981-91		1987-93		1993-96	
Classification	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Successful	31	67	23	72	21	61.8	20	54	12	54.6	63	69.2	8	88.8
Improved but failed due to other causes	8	18	6	19	6	17.3	12	32.5	5	22.7	18	19.8	1	11.11
Failure	7	15	3	9	7	20.9	5	13.5	5	22.7	10	11.0	0	Nil
Total	46	100	32	100	32	100	37	100	22	100	91	100	9	100

RAF : Royal Air Force ; USAF : United States Air Force ; CF : Canadian Forces ; IAF : Indian Air Force

psychological measures (Fig.-4)

The total non-traumatic morbidity was 57.27% before starting yoga prophylaxis and 37.23% after initiation of yoga showing a reduction of 34.99%.

Structured questionnaire study among experimental group revealed that mental concentration increased by 76%; concentration in studies increased by 48%; relaxation in cockpit by 66%, improved sleep by 45%, improved appetite by 41% and increased bowel regularity by 31% after doing yoga.

### Conclusion

Yogic exercise as a prophylaxis in reducing the incidence of persistent airsickness is effective. After its initiation in ab-initio flying training the referral for airsickness reduced by 48.59%; the non-traumatic morbidity reduced by 34.99%; suspension due to airsickness as a contributory factor reduced to 74% and the success rate increased by 22.13% more than that obtained by PET and psychological measures in the study by Deshmukh et al [5]. In addition there is definitive subjective improvement in mental concentration, concentration in studies,

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relaxation in cockpit, improvement in sleep, appetite and bowel regularity.

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Lockridge [8] and Deshmukh in our study the prevalence of prophylactic 22.13% more Deshmukh et al [5] in with PET and

Year	n	%
1993	8	88.8
1998	1	11.11
1999	0	NIL
100	9	100

Indian Air Force

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