Three-month outcomes of a structured prevention programme for acute ENT disease in military conscripts living in barracks

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Abstract

Objective. To compare three-month clinical and mucosal outcomes under a structured ENT prevention programme and routine care in military conscripts living in barracks.

Materials and methods. A prospective, non-randomised comparison included 123 conscripts aged 18–23 years with acute ENT disease: 64 received the structured programme and 59 routine care. Fifty healthy conscripts formed a reference group. The programme combined nasal hygiene, environmental measures, symptom monitoring and early clinical review. Clinical episodes, mucociliary clearance and mucosal markers were examined.

Results. At three months, the mean number of episodes was 0.80 ± 0.62 in the programme group and 1.19 ± 0.78 with routine care ($p = 0.003$). Mucociliary clearance time was 17.26 ± 1.81 versus 18.62 ± 1.73 minutes ($p < 0.001$), and secretory IgA was 108.45 ± 7.05 versus 103.73 ± 7.30 mg/L ($p < 0.001$). Between-group differences in CRP ($p = 0.076$) and duty days lost ($p = 0.111$) were not statistically significant.

Conclusion. The structured programme was associated with fewer recorded episodes and more favourable mucosal measurements. The study does not establish a reduction in duty loss or an isolated effect of nasal hygiene because allocation was non-random and several measures were introduced together.

Keywords: military conscripts; barracks; acute ENT disease; mucociliary clearance; secretory immunoglobulin A; prevention

Introduction

Shared accommodation creates a setting in which respiratory symptoms, close contact and interruptions to training occur together. Preventive programmes in military populations therefore need to address both individual practices and the conditions in which personnel live. A reduction in an inflammatory marker alone would not establish that a programme prevents clinically important illness.

Military studies have examined handwashing and respiratory illness during training, including large programme-based observations and field-training comparisons [1,2]. Nasal interventions have also been evaluated in civilian populations. A pilot trial studied hypertonic saline irrigation and gargling during the common cold, while a larger trial compared nasal sprays and behavioural interventions with usual care [3,4]. These interventions and populations are not identical to a combined barracks programme.

The present study evaluated a structured approach among conscripts already presenting with acute ENT disease. Its focus was recovery and prevention of subsequent episodes over three months, rather than the incidence of first-ever disease in an unselected military population. Clinical recurrence, duty loss and mucosal measurements were considered as separate outcomes.

Materials and methods

Study population and comparison groups

The source describes prospective observation from January 2024 to June 2026. The clinical population comprised 123 conscripts aged 18–23 years with acute ENT pathology: 64 in the structured-programme group and 59 in the routine-care group. Fifty healthy conscripts formed a reference group, bringing the wider assessed population to 173.

Allocation followed organisational matching rather than random assignment. The healthy group provided reference measurements but was not a third treatment arm. Its absence of recent clinical episodes must not be interpreted as the effect of an alternative preventive intervention.

Programme components and observation period

The structured programme included isotonic nasal hygiene, measures addressing ventilation and cleaning, attention to barracks density and indoor conditions, repeated symptom monitoring and early review when symptoms increased. An intensive initial period of 14 days was followed by maintenance measures during the three-month observation period. Routine care served as the active clinical comparison.

The source used symptom instruments, including NOSE and TNSS, and a local K-ENT index to organise assessment. The present manuscript does not treat this index as an externally validated prediction model. Because the programme combined environmental, behavioural and clinical measures, its components cannot be evaluated independently from the reported group totals.

Outcome definitions

Clinical outcomes were the number of acute ENT episodes and days of temporary duty incapacity within the source chapter's three-month windows. Laboratory and functional measurements comprised C-reactive protein (CRP), secretory immunoglobulin A (sIgA), lysozyme and mucociliary clearance time. The healthy reference measurements were used only to describe the baseline clinical context.

The wider document contains descriptions with different episode-counting periods. For consistency, the analysis retains the explicit three-month definitions in the intervention tables. Exact observation dates and event-level records require confirmation before external submission. Episodes per participant are reported as counts within that window, not as annualised incidence rates.

Statistical approach

Continuous measurements are presented as mean ± standard deviation. The source reports within-group Wilcoxon tests and between-group Mann–Whitney tests. This manuscript prioritises the between-group comparison at follow-up when discussing comparative results. Statistical significance of improvement within both groups does not by itself establish a difference between programmes.

The manuscript was assembled from aggregate tables. No individual data, new risk model or imputed observations were generated. Some printed changes differ slightly from subtraction of the rounded baseline and final means; therefore, the original endpoint values are retained without overstating the precision of change estimates.

Results

Baseline mucosal and clinical profile

Table 1. Baseline profile of the clinical groups

Measure	Programme (n = 64)	Routine care (n = 59)
CRP, mg/L	10.31 ± 2.91	10.42 ± 2.86
sIgA, mg/L	95.80 ± 7.08	95.78 ± 7.37
Lysozyme, ug/mL	9.97 ± 1.41	9.97 ± 1.41
Mucociliary clearance, min	20.44 ± 1.71	20.46 ± 1.71
ENT episodes / 3 months	1.50 ± 0.50	1.49 ± 0.50
Duty days lost / 3 months	4.97 ± 1.41	4.97 ± 1.41

Values are mean ± SD. All baseline comparisons between the two clinical groups were non-significant in the source table. The healthy reference group is described separately.

The clinical groups had closely similar baseline measurements. In the healthy reference group, CRP was 2.50 ± 0.51 mg/L, sIgA 108.50 ± 5.74 mg/L, lysozyme 12.46 ± 1.13 ug/mL and mucociliary clearance time 14.98 ± 0.82 minutes. These reference values contextualise the abnormalities present at enrolment.

The clinical cohort was selected because of acute disease. Its episode and duty-loss values are consequently different in meaning from those of the healthy group. Including the latter as a treatment comparator would confound baseline health status with subsequent management.

The nearly identical baseline means do not establish complete equivalence. Unmeasured differences in barracks exposure, adherence, previous illness or access to review could remain despite the organisational matching.

Recorded clinical episodes

Figure 1. Mean number of recorded ENT episodes in the source three-month windows.

Error bars represent SD. The follow-up between-group p value was 0.003. These are episode counts per participant, not proportions of participants with an event.

Episode counts declined in both groups, but the mean follow-up count was lower under the structured programme. This is the clearest clinical result of the comparison. It is not possible to reconstruct the number of participants with zero, one or multiple episodes from the available means and standard deviations.

The graph joins the two recorded summaries only. It does not imply regular observations between them, and the reduction cannot be converted into an annual prevention effect. Seasonal exposure and the date of programme entry may influence the number of episodes observed over a short interval.

Inflammatory and mucosal outcomes

Table 2. Measurements after three months

Measure	Programme	Routine care	p
CRP, mg/L	6.94 ± 3.29	7.95 ± 3.39	0.076
sIgA, mg/L	108.45 ± 7.05	103.73 ± 7.30	<0.001
Lysozyme, ug/mL	11.92 ± 1.44	11.15 ± 1.40	0.006
Mucociliary clearance, min	17.26 ± 1.81	18.62 ± 1.73	<0.001

Values are mean ± SD; n = 64 and n = 59. p values compare the groups at follow-up. CRP did not meet the 0.05 significance threshold.

sIgA and lysozyme were higher at follow-up in the programme group, while mucociliary clearance time was shorter. These changes were directionally consistent with recovery of local mucosal function. They do not establish that a particular marker mediated the reduction in recorded illness.

CRP decreased within both groups. The final between-group comparison, however, was not statistically significant. The result should not be summarised as a proven superior systemic anti-inflammatory effect of the programme.

The follow-up sIgA mean in the programme group was close to the baseline healthy reference mean. Similar means at two different assessments do not demonstrate restoration of an individual participant to a normal state, and no formal equivalence analysis was reported.

Biomarker interpretation also depends on collection conditions and assay reproducibility. The aggregate summaries do not allow assessment of within-person biological variation, laboratory batch effects or whether the clinical episode preceded the specimen collection.

Mucociliary clearance

Figure 2. Mucociliary clearance time before and after the observation period.

Error bars represent SD. Shorter clearance time was reported in both groups; the between-group comparison at three months was p < 0.001.

The programme group had a lower final mean clearance time than the routine-care group. Nevertheless, its mean remained above the healthy reference value of 14.98 minutes recorded at baseline. It is therefore more accurate to describe an improvement in the measured function than complete normalisation.

The clearance endpoint complements the clinical episode count but cannot replace it. A functional test may improve without a corresponding reduction in severe illness, antibiotic exposure or service disruption. Those outcomes require their own definitions and denominators; they cannot be inferred from the clearance result.

Clinical burden and local monitoring index

Table 3. Clinical and composite outcomes at three months

Measure	Programme	Routine care	p
ENT episodes, mean ± SD	0.80 ± 0.62	1.19 ± 0.78	0.003
Duty days lost, mean ± SD	2.47 ± 2.11	3.08 ± 2.05	0.111
K-ENT index, mean ± SD	31.64 ± 5.79	37.36 ± 8.12	<0.001

Baseline K-ENT values were 46.68 ± 7.21 and 46.33 ± 7.31. The index is local and composite; it is not independent proof of reduced clinical risk.

Figure 3. Secretory IgA at the two recorded assessments.

Error bars represent SD. The vertical scale begins at 70 mg/L to display the observed range; $p < 0.001$ between groups at follow-up.

Discussion

The structured programme was associated with fewer recorded ENT episodes over three months and with more favourable local mucosal measurements. The result is narrower than a claim that the programme reduced every clinical consequence of disease. In particular, the final comparison of duty days lost was not statistically significant.

Military hygiene studies support the feasibility of organisational prevention during training [1,2]. Their interventions and outcomes differ from the present bundle, however. Handwashing studies cannot establish that nasal hygiene was the active component here, and reductions observed in one training environment should not be assumed for another.

The civilian pilot of hypertonic saline irrigation and gargling evaluated an intervention after common-cold onset [3]. The present programme used isotonic hygiene and additional environmental measures. Differences in solution, population and timing preclude a direct effect-size comparison. A larger primary-care trial provides further evidence that nasal interventions can be evaluated against clinically defined respiratory outcomes, but it did not reproduce this military programme [4].

The parallel changes in sIgA, lysozyme and clearance time offer a physiological description of recovery. They do not identify a causal chain from a particular environmental change to mucosal recovery and then to fewer episodes. A mediation analysis would require individual measurements, temporal ordering and control of confounding that were not available.

Limitations

Allocation was non-random and intervention delivery was unblinded. Barracks-level exposure, seasonal variation and differential access to clinical review could influence both adherence and episode ascertainment. The source's wider descriptions of episode windows need reconciliation with its explicitly three-month intervention tables.

The healthy group was a reference population rather than an intervention arm. The local K-ENT index partly summarises clinical burden and should not be treated as an independently validated risk outcome. Aggregate data prevented analysis of repeated episodes, clustering by accommodation and missing observations. No claim of sustained benefit beyond three months or isolated efficacy of one programme component is warranted.

Conclusion

The structured programme was associated with fewer acute ENT episodes and improved mucosal measurements after three months. A comparative reduction in duty days lost was not established. Further evaluation should preserve explicit episode windows, account for barracks-level exposure and distinguish the effects of the programme from those of its individual components.

Declarations

Data provenance. The manuscript uses aggregate intervention tables from the supplied dissertation. No annualised incidence, synthetic patient records or new prediction model was constructed.

Ethics and consent. The ethics committee name, the approval number and the approval date and the consent procedure require author confirmation before submission.

Author information, funding and competing interests. The authors' names follow the supplied manuscript and the co-author information supplied for publication. The official English affiliation, corresponding e-mail, author contributions, funding sources and competing interests require confirmation.

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