Approach to Subclinical Hypothyroidism

Air Cmde KM Suryanarayana VSM
PMO, HQ, MC, IAF

Hypothyroidism is a disease state caused by insufficient production of thyroid hormone by the thyroid gland. Subclinical hypothyroidism, also known as biochemical hypothyroidism is defined as elevated TSH level in the range 6-10 micro u/ml with normal free thyroid hormone levels and may be associated with mild non specific symptoms. The prevalence of subclinical hypothyroidism is 4 to 8% in the general population and upto 15 to 18% in women, who are over 60 years of age. It is also associated with goitre more commonly and 50-80% has TPO antibody positivity. There is considerable controversy regarding the morbidity, the clinical significance of subclinical hypothyroidism and if these patients should be treated. A meta-analysis by the Cochrane collaboration found no benefit of thyroid hormone replacement except "some parameters of lipid profile and left ventricular function".

The following causes are associated with increased risk of developing subclinical hypothyroidism:-

a) Hashimotos thyroiditis

b) Treated hyperthyroidism

c) H/O neck irradiation in the past

d) Postpartum thyroiditis

e) Drug therapy - lithium, amiodarone

f) Other autoimmune disorders especially type 1 diabetes mellitus.

Even though there are arguments against therapy in subclinical hypothyroidism, the benefits of therapy are:-

a) Prevention of progression to overt hypothyroidism (Whickman survey showed hypothyroidism of 5% every year in next four years in those positive to TPO antibody)

b) Beneficial effect on serum lipid levels and on symptoms, mood and cognition

The indications for treatment with thyroxin replacement in subclinical hypothyroidism as per the current guidelines are:

a) Positive TPO antibody

b) TSH > 10 micro u/ml

c) TSH < 10 micro u/ml - treat if positive for

Symptoms of hypothyroidism	Goitre
Dyslipidemia	Pregnancy, children
Infertility	Ovulation dysfunction

The thyroxin replacement dose will be 25-50 micro g/day and all patients of subclinical hypothyroidism need annual follow up with fT4 and TSH

Metabolic Syndrome: An emerging trend

Wg Cdr Vishal Singh
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Metabolic Syndrome (MetS) consists of a cluster of risk factors that are predictive of the progression to type 2 diabetes and coronary heart disease (CHD). The genesis of this syndrome can be traced to the 1988 Banting lecture when Reaven defined a condition, he called "Syndrome X" linking hypertension, type 2 diabetes and increased propensity for atherosclerotic events to an underlying cause of insulin resistance. Reaven original name for the syndrome gave way to the metabolic syndrome to prevent confusion with another syndrome X, a name given by cardiologists to the phenomenon to angina pectoris with angiographically normal coronary arteries. MetS has now become a diagnostic entity with its own ICD code 277.7.

Increasingly the implicative pathogenesis is shifting from blaming every thing on to insulin resistance to visceral adiposity as the source of inflammation, dysglycemia, insulin resistance, endothelial dysfunction, hypercoagulability, hypertension and increase cardiovascular disease risk. It is possible that in years ahead the syndrome may be redefined as "a state of excess visceral adiposity" and possibly the name will change to "the adipo-inflammatory syndrome" or "the toxic fat syndrome". Better specific therapy will probably come once the exact pathophysiology of the syndrome is understood. Till then it is advisable to treat the individual components aggressively with both lifestyle management (diet and exercise) and rational pharmacotherapy (metformin, thiazolidione, ACE inhibitors, angiotensin receptor blockers, statins and so forth).

The Institute of Aerospace Medicine, Bangalore is actively perusing this emerging entity. A pilot project "Prevalence of insulin resistance in commercial aircrew and correlation of Insulin resistance with MetS and other variables like exercise and body weight" has been initiated to have an insight into the magnitude of the problem being faced.

Newer Trends In The Management Of Diabetes Mellitus In Aviators

Gp Capt RC Panda VSM,
Sr Advisor Medicine, CH (AF), Bangalore

Aerospace medicine is not a subset of internal medicine but a specialized branch in which sometimes it becomes difficult to apply the Principles of Internal Medicine that we practice on day to day basis. It is an environment in which we must try to apply the knowledge after carefully understanding the physiological changes which are so very different.

Diabetes Mellitus is one metabolic disorder which, in a situation of stress may create different kind of problems. The concerns in an aviator are three fold - the man, the machine, and the passenger. A fourth dimension is added in military aviation - the aviator indulged in high stress flying and the aviator in the enemy territory.

Diabetes Mellitus is a disqualification for aviators all around the world due to the main concern of Hypoglycemia that may cause sudden incapacitation.

The experience has evolved over a period of time. Metformin has been permitted in aviators. We shall dwell over certain issues like-

- Can we permit Thiozolidinediones,
- Can we permit Insulin;
- And, can we permit flying for type I Diabetics?

Obesity And Hypertension In Civil Aircrew: Preliminary Patterns & Aero-Medical Disposal

Wg Cdr VV Joshi [•] Gp Capt D Gaur [#]

[•] Classified Specialist (Aviation Medicine) & Deputy Chief Medical Officer Air India

[#] Senior Advisor (Aviation Medicine), IAM IAF Bangalore

Lifestyle related diseases amongst Indian population are on the rise and consequently similar trend could be expected amongst the civil aviation pilots. The lifestyle ofthese pilots, which is briefly discussed in the paper, makes them more prone to these diseases than the general population. We scrutinized the computerized medical records of 3948 civil aircrew in DGCA for BMI and blood pressure readings with a view to assess the patterns of these lifestyle related diseases. 47.5% of male aircrew and 26.9% of female aircrew were overweight (BMI 25.0 to 29.9 kg / m^2) and 4.1% of male aircrew and 2.4% of female aircrew were obese (BMI >30 kg / m^2). 1.6% of aircrew had Hypertension and were on medication and 0.8% aircrew had been diagnosed as White Coat Hypertension. Surprisingly a large number of male aircrew had high normal systolic blood pressure recordings (above 130mm Hg: males - 56%, females - 10.8%, above 140 mm Hg: males - 11.6%, females - 1%) and high normal diastolic blood pressure (between 84 - 90 mmHg: males 48.4%, females 7.7%. Above 90 mmHg: Males - 10%, females - 0.3%) but they were not on medications. The data clearly indicates that the prevalence of obesity and raised blood pressure is much greater in the civil aircrew population than that in the general population. The paper focuses upon the aero medical disposal strategies adopted by various aviation regulatory authorities, including the DGCA, in the disposal of obesity and hypertension. Based on this comparative assessment the paper also suggests suitable amendments that can be adopted in the DGCA policy on these diseases in the disposal of the civil aircrew.

Recent Trends In Evaluation And Disposal Of Asymptomatic Coronary Artery Disease In Aircrew

Wg Cdr H Madan
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CH (AF), Bangalore

Coronary artery disease (CAD) continues to remain the commonest cause of mortality the world over. Atherosclerotic occlusion is the most common pathophysiological mechanism of the disease and to a certain extent is age related - with a gradually increasing prevalence with increasing age. The symptomatology of this disease can range from asymptomatic occlusion to sudden cardiac death. The implications of silent forms of this disease are even more sinister for a high risk and stressful job, such as aviation, due to two factors. Firstly, any acute event in such individuals has the potential to result in loss of well trained manpower and highly expensive aircrafts - which a country like ours can ill afford. Secondly, particularly in the case of transport aircrafts, it can result in loss of life of innocent passengers. Needless to say, therefore, evaluation of coronary artery disease, in aircrew, needs to have a well established protocol that is able to detect all the cases of this disease at an early stage.

Asymptomatic coronary atherosclerotic lesions may exist in aircrew due to any of the following reasons:

1. The lesion is non obstructive and hence produces no myocardial ischemia.

2. The lesion is obstructive but myocardial oxygen demand is met with by collateral circulation.

3. The lesion does produce myocardial ischemia but that is not perceived by the individual (silent ischemia).

Evaluation of asymptomatic CAD

In the absence of a crucial clinical symptom such as angina, CAD can only be diagnosed and quantified by a screening programme such as the one followed in Air Force. This screening essentially aims at detecting CAD at one of the two levels:

1. Physiological level: Coronary ischemia at a physiological level can be detected by variously applied tests such as resting ECG, treadmill testing, stress myocardial perfusion imaging or positron emission testing (PET) scan.

2. Anatomical level:

a. The established gold standard of anatomical delineation of CAD has been coronary angiography. While the test is useful in a large number of subjects, it suffers from two drawbacks:

i. The test is invasive and hence has a small but tangible risk.

ii. The test does not give any idea about the significance of borderline lesions - which one encounters quite often in clinical practice.

b. High resolution CT scanning and coronary MRI angiography are newer, non-invasive modalities of establishing anatomical CAD.

c. Tests to determine physiological significance of borderline lesions such as intravascular ultrasound (IVUS), Doppler wire and coronary flow reserves etc.

This paper will discuss the clinical relevance of asymptomatic CAD. It will also dwell upon the various established tests for diagnosis of this condition and the specific niche of newer modalities of investigation in asymptomatic CAD.

Management Of COPD And Bronchial Asthma In Aircrew

Wg Cdr Ajay Handa, MD DM
Classified Specialist (Medicine) and Pulmonologist
CH (AF), Bangalore

Bronchial asthma (BA) and chronic obstructive pulmonary disease (COPD) are common airway disorders in general population. The presence of these make the candidates unfit for aircrew duties during initial medical evaluation. The candidates with a history of episodic cough, dyspnea and wheezing, allergic rhinitis and family history of asthma or allergic rhinitis should be evaluated for asthma. The evaluation should include thorough clinical examination, spirometry with bronchodilator reversibility testing and if required broncho-provocation testing to objectively determine their airway hyper-responsiveness (AHR).Trained aircrew who develop respiratory symptoms should undergo a thorough evaluation including spirometry with bronchodilator, chest radiography/HRCT chest and hematological and serum total immunoglobulin E(IgE) levels to establish the diagnosis and rule out other disorders/complications of Asthma.

After a period of observation, based on the symptoms, functional status and objective testing the aircrew with mild or moderate disability may be returned to flying duties gradually under close observation by the treating physician and aviation specialist. Those found to have severe disability are declared permanently unfit for aviation duties. The medications including inhaled beta 2 agonists, ipratropium bromide, and low dose inhaled steroids are acceptable with aviation duties in commercial sector. However, oral bronchodilators (theophylline derivatives and beta-adrenergic agonists) and leukotriene inhibitors and oral steroids are not acceptable with aviation duties.

Modern Management Of Presbyopia

Wg Cdr V C Bhatnagar
Classified Specialist Ophthalmology
IAM, IAF, Bangalore

Presbyopia is a very disturbing condition of middle age in which a gradually increasing divide occurs between distant and near vision leading to confusion and in-capacitance. This condition assumes special significance in Aircrew due to the complex task, which they have to perform.

Skills and capabilities are best at this middle age due to experience but Visual inconsistency leads to a very irritating confusion and possible drop in performance.

Various modalities have been in use to overcome this physical condition. It is important to highlight here that till just a decade back the only treatment practiced for this condition was 'Different types of Bifocal and Progressive Glasses' while the last decade has seen much advancement in various types of modalities as listed below which will emphasize the importance now attached to this condition.

Option^ for Presbyopia

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In the presentation, an attempt will be made to judiciously analyze various modalities with special comment keeping in mind the best achievement of as physiological effect as possible. This is likely to have great "Force Multiplier" effect on the performance of middle aged and elderly especially the Aircrew.

Aeromedical Concerns Of High Altitude Flying

Wg Cdr P C Ghosh
Classified Specialist, Aerospace Medicine
IAM, IAF, Bangalore

Problems in high altitude flying are many. Some important ones include hypobaria, hypoxia, low atmospheric temperature, unusual terrain & topography, high wind, bad weather, intense solar radiation, restriction in approach direction. These unique conditions in high altitude impact the performance of aircrafts, have immense effect on the operator ie. flyers and adversely affect operation. The aircraft performance is decreased due to rarified atmosphere and responses to controls are sluggish. The narrow valleys and proximity to enemy territory increases the flying demand with very little margin of error. Extreme cold and unpredictable weather compound the problems for the flyers especially in helicopters and unpressurised air crafts.

Because of operational commitments there is little time for the flyers for full acclimatization. This leads to decreased physical work capacity, easy exhaustion, fatiguability and hosts of other high altitude related ailments. Compromised manual dexterity and decreased survival potential after escape/ crash

landing are also matters of genuine concern. The short acclimatization schedule presently followed by aviators for high altitude operations has questionable efficacy. The paper discusses at length the problems of high altitude operations and makes an attempt to analyze the scientific rationale of the present policies on high altitude flying taking into account the time course of different physiological adjustments for complete acclimatization.

Psychological Counseling In Field

Dr Catherine S George
Scientist "F", Professor & Head,
Dept of Aviation Psychology, IAM, IAF, Bangalore

Psychological counseling is defined as "a helping relationship, which includes warmth, genuineness and a sensitive understanding of the counselee's thoughts and feelings". The counselor's repertoire of skills includes those of forming this understanding relationship and interventions focused on helping counselees change specific aspects of their *feeling, thinking and acting.* There are two aspects of counseling for medical officers in the field (a) counseling related to health psychology (b) different facets of psychological counseling that can be provided by them in other conditions. This paper will discuss important issues such as expectations, goals, and the process of counseling and counselor's necessary qualities and interviewing skills.

Grey Areas In Psychiatric Evaluation Of Aircrew

Wg Cdr A S Saxena
Classified psychiatrist, CH (AF), Bangalore

Psychiatric ailments are shrouded in mystery. The stigma associated with the illnesses further pushes the illnesses under cover. The end-result of this is that many individuals become a source of distress not only to themselves, but also to their near and dear ones. The practice of Psychiatry has undergone a revolutionary change in the past few decades. However, the IAP 4303 is still languishing in a primitive era, the starting point being terms like psychosis and psychoneurosis. The ailments are classified and the categories awarded based on the psychosis-neurosis dichotomy, which has become out dated. This leads to prolonged observations in non-flying categories that is detrimental not only to the aviator, but also to the organization. The end-result of this perceived prolonged non-flying categories results in aviators seeking psychiatric help from civil psychiatrists, which is detrimental to flight safety. The grey areas in IAP 4303, III edition revised will be discussed and changes suggested.

Altered Liver Function In Aviators: Pathologist Perspective

Wg Cdr Prateek Kinra
Classified Pathologist, IAM, IAF, Bangalore

During an assessment of an aviator if past history ofjaundice is noted or any abnormality of the liver function is suspected, full investigation is required for assessment. Candidates suffering from viral hepatitis or any other form ofjaundice are rejected. Such candidates can be declared fit after a minimum period of 6 months has elapsed provided there is full clinical recovery; HBV and HCV status are both negative and liver functions are within normal limits. Thus liver function tests are an important screening biochemical tests routinely done in the assessment of an aviator. The tests include serum bilirubin, serum transaminases, alkaline phosphatase, prothrombin time, serum proteins and albumin/globulin ratio.

Cases found to have isolated abnormalities are fully investigated to rule out underlying liver disease which may include such causes as infections, toxic, metabolic, genetic, congenital, neoplastic, traumatic, biliary obstructive, vascular, and extra-hepatic factors. If no underlying etiology is determined they are considered for award of restricted flying medical category with regular 3 monthly reviews locally and annually at IAM/ AFCME. Persistent impairment of liver function cannot be considered fit for flying duties till the etiology is established.

The paper will discuss the aeromedical disposal of aircrew with acute/chronic hepatitis, asymptomatic gall stones and NASH. The paper will also highlight the modified Knodell scoring system which is replacing the old terms like chronic active, persistent and lobular hepatitis. The disposal of aircrew with marginally altered liver functions of benign character viz. - isolated mild transaminitis, Gilbert's syndrome will be dealt upon.

MR Imaging In Disc Degenerative Disease

Wg Cdr Aftab Alam
Classified Specialist (Radiodiagnosis & Imaging)
CH (AF), Bangalore

Degenerative disc disease is responsible for tremendous cost to society both in terms of money and loss of man-hours. It is a major contributor to the estimated 60 to 80% lifetime incidence of low backache in the general population.

The term 'Disc Herniation' (or 'Disc prolapse' as termed in Europe) was coined in 1934 by Mixter and Barr when they found that posterior rupture of the intervertebral disc allowed nuclear material to escape and compress the adjacent spinal nerve root causing low backache and pain radiating down the legs. An intervertebral disc herniation occurs when the nucleus pulposus of the intervertebral disc tears its way through the annulus fibrosus and invades the anterior epidural space where neural structures are present. The presence of this nuclear material in the anterior epidural space may irritate the neural structures, which may cause the patient to suffer from low backache and sciatica.

However, modern imaging technique like MRI has demonstrated that the relationship between disc herniation and patient symptomatology is far more complex than realized. Patients with significant disc herniation on MRI may have no pain at all; and some patients with terrible low backache and sciatica, have no disc herniation on MRI! Moreover, when post-operative MRI is performed on some patients that once suffered disc herniation induced low backache and sciatica, the herniation is still there, yet the patient is asymptomatic. Conversely, some patients who fail to recover from low backache often demonstrate a disappearance of the once prominent disc herniation. There are other ironies as well; the size and severity of disc herniation do not correlate with the degree of pain and disability and even small disc bulges cause just as much pain and disability as massive disc extrusions. So, diagnosing a patient with low backache and sciatica is certainly not as easy as once believed. The aim of this presentation is to characterize the various stages of degenerative disc disease as seen on MRI and differentiate it from normal age related changes.

HUTT - The Gold Standard In Evaluation Of Syncope And Its Limitations In Aeromedical Decision Making

Sqn Ldr Pallavi Goswami
Graded Specialist (Physiology) lAM, IAF, Bangalore

An episodic loss of consciousness in aviation requires thorough evaluation for pilots' aeromedical disposition without compromising flight safety. This requires specialized investigations which prove to be cost effective in aeromedical decision making (ADM). Head-up tilt test (HUTT) was first described in 1986 for diagnosis of syncope and is now, not just a common diagnostic tool but considered 'the gold standard'. The utility of this modality comes forth when comparing the yield of positive tests in selected patients with syncope of unknown origin with the yield in subjects without the history of syncope. Drug-free tilt testing protocols give diagnostic yields of approximately 50% among patients with syncope, as compared with 10% in healthy subjects. Interpretation of results to arrive at informed ADM must weigh the following facts - studies vary widely in the patient population, so comparing yields is difficult; protocols are not standardized as regards diet and pharmacologic interventions; the accuracy of HUTT is not an established fact and reproducibility is limited. Despite limitations, HUTT is a useful tool in patients with recurrent unexplained syncope, suspected to be neurocardiogenic with typical symptoms, but without a clear precipitant. Although a single episode of syncope in high risk setting like aviation is one of the indications of HUTT, this recommendation has no outcome data. With the advent of HUTT, syncope associated with Bezold-Jarisch reflex could be identified and various treatments could be evaluated, giving rise to an algorithm to guide diagnosis and treatment. Repeat HUTT has not been established to firmly predict clinical response to drug therapy. It would be highly inappropriate if HUTT is used in a case of single episode of syncope in pilots as a follow-up evaluation to assess therapy. Risk of recurrence, especially in the cockpit must be considered seriously during ADM for fitness for flying duties.

Aeromedical Disposition Following An Episode Of G-LOC

Lt Col Surjit Sahu
Graded Specialist Aviation Medicine
IAM, IAF, Bangalore

The aircrew of military aircraft is exposed to high-sustained hazardous +Gz acceleration forces during flying. G-induced loss of consciousness (G-LOC) is due to reduction of blood flow to the brain below the critical level necessary to support conscious function. G-LOC has become an issue of major research and operational interest. G-LOC can abruptly result in pilot incapacitation, mission compromise, loss of aircraft and loss of life. Thorough evaluation of a case of G-LOC is essential to rule out other causes of in-flight incapacitation which could be due to stresses of flight like acceleration, hypoxia, hyperventilation, DCS, barotrauma, smoke/fumes in cockpit etc. or medical conditions involving the CVS, CNS or mental functions. A good history and clinical examination can go a long way in establishing a diagnosis. A full aeromedical assessment including human centrifuge evaluation and tilt table study, along with a full biochemical assessment are essential. Disposal of cases of G-LOC can be arrived at only after a cause is arrived at. Disposal has to take into consideration various aspects like pilot experience, sortie profile, flight data recordings, functioning of anti G suit, likelihood of further episodes, etc. Cases where a cause cannot be established pose dilemma during disposal and the aviation medicine specialist has to take a call on case-to-case basis.

Solitary Seizure: Issues In Aeromedical Decision Making

Wg Cdr Sanjiv Sharma
Classified Specialist (Av Med) IAM, IAF, Bangalore

Stringent pre-selection screening of pilot aspirants invariably rules out selection of neurological cases like epilepsy. This screening however does not prevent dilemmas in aeromedical decision making (ADM) whenever a case of late-onset seizure disorder presents in trained aircrew. There are various issues in establishing the diagnosis and treatment modalities at stake to arrive at ADM in a case of solitary seizure. The aircrew must be screened for other common conditions of episodic loss of consciousness (LOC) viz. syncope and LOC due to aviation stresses like hypoxia or GLOC. Other neurological causes to be considered include withdrawal seizure, pain reaction, migraine, pseudoseizure or transient ischemic episodes. If it indeed was a solitary seizure, whether it was generalized in onset or generalized spread of a partial-onset seizure? History plays a vital role in diagnosis as also the accuracy of eye witness account. The conventional investigations arid established algorithms further help in establishing the diagnosis. The ADM for fitness for aviation duties after a solitary seizure is determined by 'Risk Analysis' and 'Risk Stratification', especially ifthe aircrew is not advised any anti- epileptic drugs. Final disposition of solitary seizure can be considered for multi-crew operations but not as pilot in command (PIC) in civil aviation, after a reasonable period of observation. In military aviation, due to the rigours of service and enhanced threat of aviation stresses, the need for adequate period of observation obviates likelihood of fitness for aviation duties. Various issues in ADM in cases of solitary seizure have been discussed.

Aeromedical Decision Making: Musculoskeletal Problems In Aviators

Gp Capt N Kudva
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Musculoskeletal problems are a significant cause of morbidity in aviators due to their exposure to stressors like "G forces", vibration and axial loading during ejections. Aviators are occupationally predisposed to musculoskeletal trauma like spinal fractures, ligamental injuries and disc herniations.

Radiological investigations are an integral part in the evaluation of musculoskeletal trauma. While conventional radiography is at best an initial screening procedure to exclude bony injury it has no role to play in the diagnosis of soft tissues such as the spinal cord, spinal ligaments and the intervertebral discs. Computed Tomography is useful in the diagnosis of bony injuries but has a limited role in the evaluation of soft tissues.

MRI is a gold standard in the evaluation of the musculoskeletal system due to its multiplanar imaging capabilities and excellent rendition of bony and soft tissues. It is the modality of choice in the evaluation of the spine due to its ability to visualize clearly the spinal cord, nerve roots, ligaments, intervertebral discs and adjacent vascular structures.

My presentation aims to review the existing protocol of radiological evaluation of the musculoskeletal system with special emphasis on MR evaluation of spinal injuries.

Spinal disabilities in military aviators hard facts: bitter answers Do we need a paradigm shift?

Wg Cdr Narinder Taneja
Classified Specialist Aviation Medicine
IAM, IAF, Bangalore

Spinal disabilities continue to remain the leading musculoskeletal disability among trained military aircrew. Of these, compression fractures and degenerative disc disease are the two leading disabilities. There appears to be an apparent increase in the number of aircrew reporting with low backache and possibly an increase in the period of unfitness in aircrew suffering from these disabilities. Similarly, there has been a very large increase in the percentage of symptomatic aircrew post ejection or crash landing, despite no radiological evidence of bony injuries. Yet there appears to be no evident organizational concern for these hard facts.

This paper argues for a change in paradigm shift in evaluation, management and disposal of aircrew with musculoskeletal, in particular, spinal disabilities. There is an urgent need to adopt objective tests for evaluation of spinal disabilities. Secondly the use of prolapsed intervertebral disc as a diagnostic entity needs to be reviewed. There is also a need for organizational involvement and responsibility in the

management of aircrew with musculoskeletal disabilities which goes beyond the SMART approach that has been debated earlier. The disposal of an aircrew with clinico-radiological incongruity, once documented by Senior Advisor or consultant of the concerned speciality should be dealt administratively. Lastly, the role of financial motivation to return to flying duties is highlighted and a workable model suggested.

Low backache

Wg Cdr M S Sridhar
Neurosurgeon, CH (AF), Bangalore

The factors that determine the degree of back pain are the result of multiple factors. Structural pathology sets the stage and is the origin of the painful stimulus. The natural healing process, in most situations, results in the resolution of back pain within relatively short periods. Physical stress placed on the back through work and leisure activities may slow the healing process or irritate spinal pathology such as degenerative changes or disc protrusion. It is, however, the psychosocial situation of the patient that determines the level of discomfort and the response of a patient to the painful stimulus. The patient's psychological state, level of satisfaction with work and personal life as well as his/her social and spiritual life may impact upon the central modulation system in the brain and modify the response to pain. A great deal of emphasis is placed on visualization of spinal lesions that can result in spinal pain. To rely on anatomical changes to determine the cause of back pain can, however, be very misleading to the clinician through the mechanisms described above. A thorough neuroanatomical knowledge is essential in evaluating these patients. Awareness of biomechanical factors and the abnormal stresses subjected on the individual- either in his work environment or in the activities of daily living is of paramount importance in assessing these patients and in advising them on prevention of backache. This becomes important when low back ache occurs in aviators whose stresses are multiplied by the gravitational force that they are subjected to. A broad guide lines for managing these patients are enumerated below. The crux is to differentiate between - simple back ache, nerve root pain and serious spinal pathology (cauda equina syndrome). There are well categorized syndromes of back ache: Myofascial Syndrome, Mechanical Syndrome, Neural Compression Syndrome and Inflammatory Syndrome. Recognition of the syndrome in which a patient fits is the first step to correctly manage a case of back ache. Further treatment consists of recognition of triggering factors in the daily activities of the patient and modifying them. Short period of rest helps in early return to activity. Spinal strengthening exercises and analgesics are also important. Surgery is reserved for patients with neurological deficits and intractable pain.

Backache: a troublesome malady
Psychcosocial factors, evaluation & management

Surg Cdr Asif Iqbal Ahmed
Classified Specialist (Psy), Institute of Naval Medicine, Mumbai

Backache is extremely common affecting 80%-90% of adult men and women between the ages of 30 and 50 years of age. Backache is a particular challenge because it is so common, demanding of medical resources and a major cause of physical, psychological and social disability. It is important to be able to assess backache accurately, with clear aims and methods to achieve appropriate management but also to identify important pathology without wasting resources.

Much different pathology can cause backache or pain referred to the back. However, less than 1% of people with low backache will have a serious pathology (spinal tumor, infection, ankylosing spondylitis etc). Less than 5% of people with low back pain will have true nerve root pain. Psychological, social and economic factors play an important role in a large number of individuals with chronic low back pain and disability.

The paper discusses the evaluation and assessment of backache keeping in view the diagnostic triage which is to be applied. A brief review of the disorder in aviation will be presented.

Musculoskeletal Disorders In Commercial Aviation

Dr. P. S. Bhattacharya, MD
Chief Manager (Medical) with NACIL (Eastern Region), Indian Airlines, Kolkata

The musculoskeletal disorders (MSD) are extremely common, which make up for 30% of the total sick report by the Cockpit and Cabin Crew in any aviation setup. In my observation of last 5 years of years of medical records available at one of the busiest dispensaries of erstwhile Indian Airlines, the incidence was close enough, being almost 33%. Incidence was more common in Cabin crew with female preponderance, and was more common in older crewmembers probably due to age related degenerative arthropathy.

It is a condition where a part of musculoskeletal system injured over time. It occurs when the body part is called in to work harder, stretch farther, impact more directly or otherwise function at a greater level than it is prepared for. The immediate impact may be minute, but a repeated trauma can cause cumulative damage. Awkward posture (excessive bending, twisting or reaching) excessive accelerative or decelerative forces, repetitive work and extended duration of effort, sustained constant position and wide fluctuation of temperature and humidity can result in MSD.

MSD can be conveniently classified into Inflammatory and Non-Inflammatory type, the former including infective and autoimmune variety, while the later may include those arising from minor repeated trauma or ergonomic disadvantage, major trauma, neoplasm etc. Out of these the ' soft tissue pain ' e.g.

tennis elbow, rotator cuff tendinitis of shoulders, fibromyalgia, neck pain, low back pain and osteoarthritis of knee joints amount to almost 20-30% of cases.

Aviation industry strongly relies on its well trained & experienced manpower on its operational front to have an extra edge in the prevailing fiercely competitive scenario in a backdrop of a relative deficit trained human resource in market. Enhancement in flight schedules with long haul flights transgressing time zones, increasing sectors, bad weather, poor and difficult landings, rescheduling and operating on minimum permissible crew adds to the strain of the personnel. Pending replacement of aging aircraft also add to the operational discomfort in outmoded design and improper harness. Crew has to cater to the demands from the organization, the social domain as well as the all-powerful consumer. The conflict arising from these External Demands add on to Internal Demands not only for pay, security and prospect but for a release from drudgery of repetitive actions of similar nature. This is compounded by lack of physical conditioning, age and mindset.

Cumulative stress and strain with enhanced workload and poor system culminates into repeated exposure to smaller trauma resulting in MSD in most cases. Fortunately a large proportion of patients respond very well to conservative treatment with rest, NSAIDs, Muscle relaxants, local hot or cold fomentation and physiotherapy. The period of incapacitation is short and they return to full activity at earliest.

Conservative medical management is sufficient in most of the MSD cases as the symptoms are short lived and patients recover without residual deficit. Rest, analgesics, muscle relaxants and physiotherapy is adequate in 80% cases, Hematological and radiological tests compliment a provisional diagnosis made with history and clinical examination in order to differentiate soft tissue pain syndromes from major trauma or arthropathies. Surgical interventions and tertiary consult is obtained when warranted. Basic goal is to rehabilitate and reinstate the crew to their station as early as practicable.

Call For Papers
48th ISAM Conference

The annual conference of Indian Society Of Aerospace Medicine is scheduled to be held at IAM, Bangalore from 01st Dec 08 to 03rd Dec 08. The Scientific Committee invites authors who intend to present papers at the conference to forward the same to:

Organizing Secretary,
IAM, IAF,Vimanapura PO,
Bangalore 560 017

The advance copies of scientific papers / posters are to be submitted in 2 hard copies (abstract & full text) and 1 soft copy on CD in accordance to the guidelines to authors published in IJASM Winter 2007 issue. The last date receipt of full text paper and biodata (on CD) is 15 Aug 2008. The soft copy can also be forwarded online to isamconference 2008@gmail.com