EPISODIC NEUROLOGICAL DYSFUNCTION (EPILEPSY), CLINICIANS & FLYING

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Introduction:

Episodic Neurological dysfunction is a common condition seen in day-to day practice, epilepsy being the importance cause. hence it can occur in the Air Crew or pilots. One can very well imagine what can be the consequence if neurological dysfunction occurs in a pilot while flying. Such condition is not compatible with safety flying. So it is one of the commonest causes of loss of license of aircrew.

Flight Safety & Clinician: Clinicians or neurologists are often the first persons to attend to such cases. They diagnose and treat the cases but sometimes they lose sight of the safety of the passengers and the public. they must give due importance to 'Flight Safety'. But I find concept of 'flight safety' seriously lacking in the clinicians.

As clinicians, we have been seeing, and treating patients day in and day out. We become so focussed on them, that we tend to develop 'tunneled' vision. Even if we are aware of his profession as pilot, oversight of 'flight safety' easily occurs. We would probably subconsciously suppress it or do not give due importance to it or even ignore it. If there is any doubt, benefit is given in favour of the patient, in this instance, aircrew that can be a hazard to flight safety. But an aeromedical consultant or clinician with Aviation Medicine background will think twice before allowing such cases back to flight status.

I would like to give two examples that I have come across during my career as an aviation medicine specialist airline doctor and Civil Aviation Medical Board Member-coordinator to justify my statement.

Example 1, In 1972, 28 years old Captain, with nearly 1000 hours' flying experience, was admitted in a premier hospital in the valley with the history of loss of consciousness and fall from the bed at night. He was investigated fully including lumbar puncture and then discharged with diagnosis of mild hypertension on Carbamazepine. He continued to fly. It did not appear right to me. I called him as an airline doctor, interviewed and examined him. He was normotensive and diagnosis of epilepsy was questionable for which Carbamazepine might have been given. But we can imagine what the physician might have in his mind. He was neither sure of nor could rule out the diagnosis of Epilepsy in the pilot. He was also aware that the label of Epilepsy in a pilot would lose his license and another attack during flight can be catastrophic. Hence as a safe way out, he must have thought, was to give a tentative diagnosis of 'mild hypertension' and at the same time treat him with carbamazepine in case it turned out to be epilepsy. In any case the benefit of doubt was given to the captain he was treating. I withdrew the Carbamazepine gradually and later took an opinion of a neurologist who also did not agree that it is a case of epilepsy. I am glad to say that he did not have further episode of loss of consciousness and is still flying.

Example 2. Recently, a pilot, aged 35 with flying experience of 1400 hours, had 'fit' during sleep

and was seen by a neurologist. He was diagnosed as Epilepsy- Generalized Seizure Disorder due to ? Neurocysticercosis after examination and investigation including EEG and MRI brain. He was treated with and anti-convulsant and after two weeks he was allowed to fly on the ground that 'fit' had occurred during sleep and so it will not occur during wakeful period and at day time. he again got seizure with loss of consciousness after five months while waiting in the crew rest room. He had completed the morning sortie and was waiting for the next flight. Here again, benefit of the doubt was given to the pilot. One can imagine what could have happened if the fit had occurred during flight, especially during the critical phases of the flight of take off and landing. When there was so much of workload in a short span of time.

Epilepsy : Epilepsy in no an uncommon condition. Worldwide population studies have shown that 2-4 % of all persons suffers from recurrent seizures at some time or other during their lifetimes. This is again more common in the third world countries than in the developed countries. It can manifest at any age. It is a recurring condition. It causes altered cerebral function- motor or sensory or cognitive or emotional, that means incapacitation. He is totally normal in between attacks. the crux of the matter is the significant risk of acute incapacitation and its potential for recurrence. So clinical diagnosis of epilepsy is incompatible with safe flying. Even on the suspicion of epilepsy the aircrew is grounded.

Diagnosis of Epilepsy: The diagnosis of epilepsy is essentially a clinical and individual diagnosis. In normal clinical practice the diagnosis depends largely on the objective description by a second person of a recognizable seizure. A confident diagnosis is not usually entertained until a second observed attack has occurred. Eyewitness account has the most important value in diagnosis of epilepsy. But is must be from an intelligent and reliable witness. EEG and CT Scan or MRI are the most helpful when they are positive. At times it may be difficult to diagnose whether it was really a 'Fit' of only a 'Faint' In such a situation to make a decision in a pilot is still more problematic as flight safety comes in here. I would like to give an example.

In 1985, a young pilot, 29, with 2766 hours experience, had convulsive seizure with loss of consciousness and was treated in an emergency room with Diazepam IV and anticonvulsant therapy was started with diagnosis of Epilepsy. Later a neurologist saw him and on history and a high attenuating ring in left frontal region of enhanced CT scan of brain diagnosed him Epilepsy and continued with the anticonvulsant. He was naturally grounded. Later he denied having seizures but said that he had only fainted. His story was he was running fever due to throat infection and was on antibiotics and was resting at home. Because of crew shortage he was called for flight duty. After the morning flight he took an antihistamine tab and flew back to base. He felt exhausted and thirty. He took few glasses of local whiskey. He was feeling unwell and drowsy and fell down from the chair and lost consciousness and woke up next morning without any recollections of what had happened in between. Meanwhile he had consulted other neurologist and had repeat CT scans which were reported normal. One favored the diagnosis of 'faint', but others were not definite. Ultimately he underwent 4 vessel angiography in the U.K. which was reported as showing an abnormality in the left frontal region consistent with a small AB malformation, possibly of thromboses type. The English neurologists were not inclined to label it as Epilepsy as there were valid circumstances that could cause 'faint and unconsciousness' and there was no recurrence. They also argued that even a 'faint' could sometimes cause convulsion. But hey did not entirely rule out the possibility of 'epiliepsy'. His license was revalidated with restriction but only after observation and grounding for nearly two years. I hope this goes on to prove my point as to how it can pose a vexed question whether to allow or not to allow such a pilot to fly.

Tests in Episodic Neurological Dysfunction: Following tests are usually carried out in the Institute of Aerospace Medicine, Banglore, India in cases of Episodic Loss of Consciousness in aircrew.

EEG	Echocardiogram
CT Scan/MRI	Head up tilt
Psychometric	Centrifuge evaluation
Holter Ambulatory ECG	Vestibualar evaluation
TMT	

Epilepsy in Nepalese Pilots : It is not surprising that there were some pilots in our Nepalese pilot population who had seizures and were diagnosed epilepsy and consequently grounded temporarily or permanently. They are given below.

S.No	Age	Experience	Year	Diagnosis	Remarks
1.	28	Nearly 1000 hrs	1972		Loss of Conciousness, ?Epilepsy Initially treated with CBZ, Temporarily grounded; still flying
2.	29	1000 + hrs	1974	Epilepsy due to A-V malformation	Permanent loss of license, operated, leading normal life
3.	28	200 hrs	1982	Epilepsy, Idiopathic	Permanent loss of license
4.	29	2766 hrs	1985	Epilepsy or Faint	Grounded for nearly 2 yrs, return to flying with restriction; stopped flying again
5.	24		1999	Epilepsy	Medically unfit for issue of CPL
6.	35	1400 hrs	1999	Epilepsy due to ? Neuro-cysticercosis	Presently grounded

The above two pilots, Nos 1 & 6, had already been described. One is still flying, the is presently grounded. Two other pilots, Nos 2 & 3, lost the their license permanently. No 2 was a 29 years pilot who was consequently diagnosed to have A-V malformation and was operated. No 3 was a pilot from Royal Nepal Army Air Support Wing and was permanently grounded after a single episode of convulsive seizure with loss of consciousness. He was not treated with anti-convulsant. It will be interesting to note that he further had two episodes of convulsive seizures, one 5 years after and other 15 years after the first episode. He is no more a pilot but is still actively serving in Royal Nepal Army. No 5 was a young pilot who just completed the pilot training from USA. he developed a typical seizure with loss of consciousness in the cockpit seat when attempting to start the engine during his training in Nepal before joining the airline few months ago. The eyewitness account from the instructor pilot was so typical that he was not allowed further training and advised against to take up the pilot profession. Obviously he will not pass the medical examination for the issue of pilot license.

Clinician's Responsibility: As clinicians, we have our responsibility towards the patient as well as to the public. We diagnose and treat the pilot suffering from epilepsy, but we cannot ignore the public safety. hence when we are treating an aircrew, we should ask ourselves if the illness can make him suddenly unable to operate the aircraft safely or to perform his assigned duty safely . If so, he should be grounded. We should not \only advise but educate and convince him abstaining from flying and also inform the airline about the illness for the sake of flight and public safety. Wee know even in cases of vehicle drivers license will not be given unless he is free from seizure for one year or had only norcturnal seizures for more than three years and the regulation is stricter in case of public service and heavy vehicle drivers. So in case of aircrew it has to be even more cautious and strict. However to allow or not to allow the pilot the flight status is the territoty of the Civil Aviation Medical Board, who decides on the accredited medical certificate of the experts in the relevant specialities including aviation medicine. International Civil Aviation Organization, ICAO, in its Standard Practices & Recommendations (SARPs) annex 1 (Personnel Licensing) clearly states" the applicant for pilot license shall not suffer from any disease or disability which could render him likely to become suddenly unable to operate an aircraft safely or to perform his assigned duty safely.

Usually a clear syncopal attack in appropriate circumstances will not require to ground an aircre
But if the attack of unconsciousness is of uncertain aetilogy, a period of grounding and observati
is advised.

The period could be as long as 24 months since the recurrence of seizure occurs within 2 years
most cases. In case of recurrent epileptic seizure or even in a solitary definite epileptic seizure,
aircrew usually is permanently grounded. But with the vast knowledge and experiences gain
about this condition, definite diagnosis with modern tests, specific treatment, multicrew aircra
and automation, attitude is changing towards being less stringent, but only after adequate period
observation and initially with restrictions in multicrew aircrafts. There is again Incapacitation Dr
given to the pilots to train to recognise incapacitation in the fellow pilot in the cockpit and to ta
corrective measures during flight.

We should also take extra caution in treating the aircrew. He may be flying with the medicines w
have prescribed. Any drug having action on central nervous system which can have adverse effe
on cognitive function or judgement or performance, is a flight safety hazard. Though they may no
have shown adverse effect on the ground, they may manifest while in flight due to hypoxia an
stress.

An aspiring young man may ask if he can go for pilot training. But if there is any predisposition t
epilepsy, he should be advised against it. Those conditions are history of "fit" after after the of five
severe head injury and any illness with high risk of epilepsy. It is also advisable to include EGG i
medical examination before taking up pilot training, as generalized or focal spikes with paroxysms
suggest predisposition to epilepsy's