

The Development of Turkish Aviation Medicine: First Altitude Chamber of Both Turkey and Middle East

Havacılık Tıbbının Ülkemizde Gelişimi: Türkiye'nin ve Orta Doğunun İlk Alçak Basınç Odası

Nazım ATA^a

^aAircrew's Health, Research and Training Center, Eskişehir

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Yazışma Adresi/Correspondence:

Nazım ATA
Aircrew's Health, Research and Training Center,
Eskişehir Military Hospital,
Physiological Training Center, Eskişehir,
TÜRKİYE/TURKEY
dokornazim@yahoo.com

ABSTRACT The first flight surgeon of Turkey, Yusuf Balkan, was sent to France and Italy for training in the field of aviation medicine in 1929. Aviation medicine has an increased importance after this date and many medical doctors were sent to foreign countries for training in the field of aviation medicine. In May 1947, TAF had 1126 pilots but the number of flight surgeons was 8. Pilots were examined by these flight surgeons that were trained in France, Italy and US. They were not subjected to hypoxia training in hypobaric chamber. There were some deficiencies at trainings and examinations of aircrew due to the lack of hypobaric chamber in our country. On the 12th of July, 1947, a military aid agreement was signed between the United States and Turkey. Military Aid Mission first started its duty with establishing a sixsome mobile hypobaric chamber to Eskişehir, Turkey so as to pave the way for the aviation medicine in Turkey. Hypobaric chamber training was started from the date of the 1st of August, 1948. This device was the first and single hypobaric chamber of both Turkey and Middle East. The establishment of hypobaric chamber in Turkey has become one of the milestones in the development of aviation medicine.

Key Words: Aerospace medicine; history of medicine

ÖZET Türkiye'nin ilk uçuş tabibi, 1929 yılında Fransa ve İtalya'da havacılık tıbbi eğitimi alan Yusuf Balkan'dır. Bu tarihten sonra havacılık tıbbının önemi artmış ve birçok doktor eğitim almak üzere yurtdışına gitmiştir. Mayıs 1947'de 1126 pilota karşılık sadece 8 uçuş tabibimiz vardı. Pilotların muayeneleri Fransa, İtalya ve ABD'de havacılık tıbbi eğitimi almış bu uçuş tabipleri tarafından yapılmaktaydı. Muayene kapsamında alçak basınç odası (yüksek irtifa çemberi) eğitimi bulunmaktaydı. Bu nedenle eğitim ve muayenelerde eksiklikler ortaya çıkmaktaydı. Ancak 12 Temmuz 1947'de ABD ile imzalanan askeri yardım antlaşması çerçevesinde ilk olarak Eskişehir'e bir alçak basınç odası kuruldu. Böylece ülkemizde havacılık tıbbının gelişmesi için en önemli adımlardan biri atılmış oldu. Alçak basınç odası eğitimleri 1 Ağustos 1948 tarihinde başladı. Bu cihaz sadece ülkemizde değil tüm orta doğuda kurulan ilk alçak basınç odası idi. Alçak basınç odasının kurulması, havacılık tıbbının ülkemizde gelişmesindeki dönüm noktalarından biri olmuştur.

Anahtar Kelimeler: Havacılık tıbbi; tıp tarihi

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The first flight surgeon of Turkey, Yusuf Balkan, was sent to France and Italy for training in the field of aviation medicine in 1929. Aviation medicine has an increased importance after this date. He made some regulations relating to medical examinations of aircrew. There were some deficiencies at trainings and examinations of aircrew due to the lack of hypobaric chamber in our country. In this study, I want to focus on the

history of the aviation medicine by telling about the establishment of first and single hypobaric chamber of both Turkey and Middle East of its era.

ESTABLISHMENT OF ALTITUDE CHAMBER

On the 12th of July, 1947, a military aid agreement was signed between the United States (US) and Turkey. According to this agreement, US government aided military equipment for TUAFA, especially for Turkish Air Force (TAF). Military aid to TAF included also medical issues.¹

In May 1947, TAF had 1126 pilots but the number of flight surgeons was 8. Pilots were examined by these flight surgeons that were trained in France, Italy and US. They were not subjected to hypoxia training in hypobaric chamber.²⁻⁴

US Air Force Military Aid Mission departed from US on the 1st of March, 1948. A 14-person delegation of Air Force Military Aid Mission which arrived at Ankara, Turkey on the 13th of March, 1948, included flight surgeon Colonel Ralph Switzer and altitude chamber operator Master Sergeant Eldon L. Sanders.⁵ Before the departure of this Mission from US, Mission had meetings with TAF representatives during a time period of 60 days so as to determine what the needs of Turkish aviation medicine were. Since high-performance aircraft would be sent to Turkey for the use of TAF by US Air Force, training of the aircrew in hypobaric chamber, determining the health standards, training of the medical doctors in the field of aviation medicine and renovation of the basic physical requirements, constructions and equipment of the health facilities of TAF bases were the topics on which agreement was achieved.^{2,3}

Mission first started its duty with establishing a sixsome mobile hypobaric chamber to Eskisehir, Turkey so as to pave the way for the aviation medicine in Turkey.^{2,3} The decision of establishing a hypobaric chamber in Turkey was very exciting and welcomed. Because Hypobaric Chamber was a very valuable training device, Master Sergeant Harold J. Lichty, the Hypobaric Chamber Operator of Armstrong Aerospace Medicine Research Laboratory, accompanied to device during the sea

travel from New York City Port, USA to Port of Iskenderun, Turkey and train travel from Iskenderun to Eskisehir.⁵ Hypobaric chamber was very interesting device for Turkish people, and wondering eyes were on it along the way because the device looked like an oil storage tank, had light port on the front, back and flank sides and was mounted on a 12-foot semi trailer. Additionally, two large electric vacuum pumps were placed on its back side. Master Sergeant Harold Lichty used hypobaric chamber as his house during his 48-day journey from New York to Eskisehir. Sometimes he had to wait 3-4 days in stations during the train travel. Establishment of the device in Eskisehir Air Base was a very significant event. Exaggerations about the device like “a monster in the air base” spread immediately on the bush telegraph and people came miles away from Eskisehir to see this monster. A building which was just 50-60 meters away from the railroad, was identified as the place for being used as a hypobaric chamber training laboratory. A temporary road was built on the back of the building so as to place the device in the building. Also a classroom including oxygen system models was constituted in this laboratory. After these preparations, hypobaric chamber was ready for hypoxia training only four weeks after its arrival to Eskisehir Air Base. Hypobaric chamber was first flown on the 27th of July, 1948. After some experience flights, hypobaric chamber training was started from the date of the 1st of August, 1948.^{3,6}

Brigadier General John Hargreaves, Deputy Air Surgeon of US Air Force, inspected and examined hypobaric chamber training and other educational tools and materials of aviation medicine in Eskisehir in August 1948. A briefing was presented during this inspection and examination visit. According to the information obtained from this briefing, 24 medical doctors and 75 pilots took hypobaric chamber training and oxygen systems course in August, 1948.⁵ According to “Hypobaric Chamber Training Program Report” which was prepared on the 3rd of March, 1949, hypobaric chamber was flown 16 times for examination, 5 times for research and 81 times for hypoxia training. All of the personnel, who participated in these

trainings, were subjected to sanitary inspection before these flights. These examinations were performed especially on circulatory system and otorhinolaryngology. 473 aircrew were trained in 81 hypobaric training flights. Pilots of friendly and allied countries were trained in this hypobaric chamber in the following few years.³

This device was the first and single hypobaric chamber of both Turkey and Middle East.⁵ After Eskisehir Air Force Hospital was put in to service on the 27th of October, 1948, hypobaric chamber was transferred to Air Physiology Laboratory on the 12th of January, 1950, which was especially built for its establishment.^{3,4,6} Following establishment and use of the hypobaric chamber in the treatment of pertussis, Eskisehir Air Force Hospital and its medical doctors earned reputation throughout the country.⁴

DISCUSSION

Two friends of Paul Bert, a French physiologist, wanted to break the altitude record, but they didn't know the effects of altitude. So in 1962, Bert constructed a chamber that would reproduce the barometric pressure of altitude. He used this chamber in a number of experiments and it was the first to be used as a physiologic training device.⁷ 30 years before Paul Bert's altitude chamber, Victor Theodore Junod, a French physician, was conceived and constructed the first altitude chamber. Early on, altitude chambers were used for clinical research and to treat diseases thought to be improved by reduced air pressure.⁸ After the first flight, usage of altitude chambers changed and altitude chambers have largely been used by people who wish to learn the effects of high-altitude on the ground conditions.⁷ With the making of the first successful, powered, piloted flight in 1903, there was acceleration in the field of aviation and lots of flight schools were opened in many countries.⁹ However, as a result of human-induced aviation accidents, people understood that altitude may cause hazardous effects on the human body. A 1916 British study revealed that of every 100 British military pilot deaths during the

first year of World War I, 60 as a result of some momentary physical failing, 30 as a result of pilot error, 8 from aircraft defects, and 2 from enemy action. As a result of these findings, medical examinations are now required for pilots.^{10,11} In these health examinations low pressure chambers were also used which was developed by Paul Bert. Also in our country, a medical examination was performed on pilots who were sent to other countries for pilot training.³ However, the effects of flight were not known by medical doctors in our country. So their examinations were made without the knowledge of aviation medicine. Since, our country did not possess an altitude chamber pilots were not exposed to altitude chamber training. The first flight surgeon of our country, Yusuf Balkan, returned to Turkey in 1931 after completing his education in aviation medicine. In 1932 he made a circular about the medical selection and regular follow-up of pilots. Until the year 1931 aviation medical examinations have been made by practitioners who were not trained in the field of aviation medicine. As other physicians who were trained in the other countries returned, medical examinations of pilots have been conducted according to pilot's medical criteria.³ Establishment of the Turkish Air Force and flight surgeon training, and determining of pilots' medical criteria was carried out in parallel with the developed countries. By the acquisition of the first and only altitude chamber of our country and the region, our country has been a pioneer in the field of aviation medical.

CONCLUSION

Turkish Air Force was established before many countries in the world. Parallel with the development in aviation, many medical doctors were sent to foreign countries for training in the field of aviation medicine. The establishment of hypobaric chamber in Turkey has become one of the milestones in the development of aviation medicine. But unfortunately, with such a background the information on the history of aviation medicine in Turkey is very few.

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