Acupuncture-related adverse events

ARAE

a systematic review of the Chinese literature

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AUTONOMY
NON-MALEFICENCE
BENEFICENCE
JUSTICE
Definition of Adverse Event

An adverse event is an injury or untoward event due to treatment, including failure to treat. “

Acupuncture is a surgical procedure and thus, clearly not entirely safe
Anatomy of the Cervical Region (Neck)
Serious Acupuncture-related Adverse Events

Pneumothorax
cardiac tamponade
spinal cord injury
and viral hepatitis
Results of ARAE out of china

local pain from needling
(range: 1.1–2.9%)
The most common adverse events

slight bleeding
or haematoma (range: 2.1–6.1%).

In a prospective observational study of 190,924 patients, the incidence of serious adverse events (death, organ trauma or hospital admission) was about 0.024%.

Another large-scale observational study showed a rate of adverse events requiring specific treatment of 2.2% (4,963 incidents among 229,230 subjects).
Result of ARAE out of china

In a prospective observational study of 190,924 patients, the incidence of serious adverse events (death, organ trauma or hospital admission) was about 0.024%.5
Another large-scale observational study showed a rate of adverse events requiring specific treatment of 2.2% (4963 incidents among 229,230 subjects).
systematic review of the Chinese literature on ARAE
In December 2009 searched the following electronic databases: Chinese Biomedical Literature Database (1980–2009),


The search terms were: (acupuncture OR needle) AND (induce OR cause OR adverse event OR adverse reaction OR side effect OR complication OR harm OR risk OR mistake OR infection OR injury OR fainting OR haemorrhage OR bleeding OR death OR pneumothorax OR pain).
Researchers searched for these terms (in Chinese) as free text in the title or abstract, and also hand-searched the reference lists of all reports located through the electronic searches.
Method

Case reports, case series, surveys and other observational studies were included in the review if they reported factual data on complications related to acupuncture.

Review articles, translations and clinical trials were excluded.

The search was limited to Chinese-language papers.
Inclusion/exclusion criteria

Included:

reports on traditional needle acupuncture, defined as a procedure in which stainless steel filiform needles are inserted into acupoints – acupuncture points located throughout the body that are associated with specific therapeutic effects – and manipulated in place.

Excluded:

Other types of acupuncture, such as electroacupuncture, laser acupuncture and auricular acupuncture,
Results

115 articles Chinese language
(98 case reports and 17 case series)
1980–2009
Classification of ARAE

1. Arachnoid and spinal duramater
2. Thoracic organs and tissues
3. Abdominal organs and tissues
4. Neck area
5. Eyes
6. Peripheral nerves, vessels and other tissues
7. Needling site pain and broken needle
8. Infectious events
9. Other adverse events
Arachnoid and spinal dura mater

Nine cases of spinal epidural haematoma (in the cervical, thoracic and lumbar spine) were reported. No further information was provided.

Subarachnoid haemorrhage was reported in 35 patients, 3 of whom died.
The others recovered after 1 to 8 weeks of treatment.
Dura mater

The dura mater is the outermost of the three layers of the meninges surrounding the brain and spinal cord.
The acupoints most frequently involved in cases of subarachnoid haemorrhage and spinal epidural haematoma

Fengchi (GB20),
Yamen (GV15),
Fengfu (GV16),
Dazhui (GV14)
Tianzhu (BL10).

In several cases, the needles were inserted to a depth of 4 to 5 cm below the skin’s surface,
GB 20 Acupuncture Point - Feng Chi - Gall Bladder Meridian

In a depression between the upper portion of the SCM and the trapezius, level with GV 16
GV 14 Acupuncture Point - Da Zhui - Governing Vessel Meridian

Below the spinous process of C7
UB 10 Acupuncture Point - Tian Zhu - Bladder Meridian

1.3 cun lateral to GV 15 in a depression on the lateral aspect of the trapezius.
Thoracic organs and tissues

With a total of 201 cases, pneumothorax was the most frequently reported acupuncture-related adverse event.

Four patients died from it and the others recovered after 2 to 30 days of treatment.
An X-ray of a human chest area
Pneumothorax

Pneumothorax is a collection of air or gas in the pleural cavity of the chest between the lung and the chest wall.
Thoracic organs and tissues

The acupuncture sites in these cases were primarily in the shoulder and scapular regions (64%) and in the chest (24%).

In two cases, the Tianding (LI17) point in the neck area had been needled.

The most frequently used acupoints were Jianjing (GB21; 30%), Feishu (BL13; 15%), Quepen (ST12; 10%) and Tiantu (CV22; 10%). Other acupoints were Ganshu (BL18), Shenshu (BL23), Tianding (LI17), Jiuwei (CV15), Juque (CV14), Jianzhen (SI9), Quyuan (SI13) and Dingchuan (EX-B1).
GB 21 Acupuncture Point - Jian Jing - Gall Bladder Meridian

On the shoulder directly above the nipple at the midpoint of a line connecting GV 14 and the acromion at the highest point of the shoulder.
UB 13 Acupuncture Point - Fei Shu - Bladder Meridian

1.5 cun lateral to GV 12 level with T3
Abdominal organs and tissues

Injuries of abdominal organs and tissues were reported in 16 patients, all of whom recovered after surgery. These instances included perforations of the gallbladder, of the bowels and of the stomach, frequently complicated by peritonitis.

A 2-year-old boy suffered intestinal wall haematoma with intestinal obstruction after acupuncture treatment for diarrhoea.
Abdominal organs and tissues

The acupoints associated with such adverse events were Tianshu (ST25), Zhongwan (CV12) and Qimen (LR14).

Most of the patients underwent acupuncture for abdominal pain, attributable mainly to appendicitis or cholecystitis. Deep needling accounted for most of the abdominal injuries.
Abdominal Organs

Diaphragm
Stomach
Spleen
Kidney
Liver
Gallbladder
Pancreas
Small Intestine
Large Intestine
Aorta
Inferior Vena Cava

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CV 12 Acupuncture Point - Zhong Wan - Conception Vessel Meridian

Midway between CV 8 and CV 16, 4 cun above CV 8 (umbilicus).
ST 25 Acupuncture Point - Tian Shu - Stomach Meridian

2 cun lateral to the CV8.
Neck area

Six cases of injuries in the neck region were reported, including neural injuries (4), a false aneurysm of the carotid artery (1) and thyroid haemorrhage (1).

One patient died after acupuncture at the Tiantu point (CV22); the needle had been inserted to a depth of 6 cm.
Neck Anatomy
Eyes

Five articles reported injuries to the eyes, including orbital haemorrhage (3),

traumatic cataract (1),

injury of the oculomotor nerve (1)

and retinal puncture (1).
Anatomy of the Human Eye
Peripheral nerves, vessels and other tissues

Three cases of haemorrhage were reported after acupuncture on the cheeks and the hypoglottis.

One case of calf haematoma complicated by diabetic foot was caused by needling at the Tiaokou (ST38) and Chengshan (BL57) acupoints.

Four cases of peripheral motor nerve injuries and subsequent motor dysfunction were reported.

Three children suffered adductor muscle fibrosis and adduction deformity of the thumb as a result of local vascular and muscular injuries from needling at the Hegu point (LI4).
Peripheral nerves, vessels and other tissues

The acupoints most frequently involved in the injuries were Taiyang (EX-HN5), Neiguan (PC6) and Hegu (LI4).

Forceful needle manipulation at these points, which are quite superficial, can cause injury to peripheral nerves, capillaries and muscle fibres.
Needling site pain and broken needle

Four cases of pain at the needling site were reported in two articles.

An intra-abdominal lump turned out to be caused by an acupuncture needle fragment that had broken off 15 years earlier.
Infectious events

Nine cases of bacterial infection
and two cases of viral infection were reported.
All patients recovered after appropriate treatment.

Infections were mainly due to poor sterilization of acupuncture needles.

Acupoints on the head became infected most often, perhaps because hair makes it difficult to implement aseptic technique.

Two cases of facial abscess may have been caused by acupuncture to relieve toothache.
Other adverse events

A total of 172 acupuncture-related adverse events that were neither due to trauma nor to infection were reported. Local allergic reactions occurred after acupuncture in four patients with an allergy to metal needles.
Other adverse events

In this review,

fainting was the most common adverse event associated with acupuncture, and it occurred primarily in patients receiving acupuncture for the first time.

In total, 150 cases of fainting were reported.

In one report of 82 cases, 60% of the patients fainted during the first treatment.

Of these 49 cases, 83% occurred when acupuncture was being applied to the head or neck.
Other adverse events

Stroke after acupuncture was reported in five patients (aged from 58 to 73 years).

One case of stroke occurred in a 72-year-old woman who received acupuncture on her arm.

The other four patients had a history of stroke and hypertension.

Three patients died from cerebral haemorrhage that was considered to be causally related to the acupuncture.
Other adverse events

Other adverse effects included cardiac arrest, shock, fever, cough, thirst, aphonia, leg numbness and sexual dysfunction. However, the existence of a causal link between acupuncture and these adverse events is uncertain.
Discussion

Injuries and infections appear to be related to inappropriate technique, whereas other types of adverse events are not.

Fainting is vasovagal in origin and minor bleeding is sometimes inevitable.
Discussion

Infections result primarily from poor aseptic procedure and insufficient knowledge on the part of acupuncturists, who often disinfect reusable acupuncture needles with alcohol instead of sterilizing them.

The use of disposable sterile acupuncture needles and guide tubes is strongly recommended.12
Discussion

Most traumatic events are caused by improper manipulation in high-risk acupoints.
The depth of needle insertion is crucial.

The lung surface is about 10 to 20 mm beneath the skin in the region of the medial scapular or midclavicular line.
This may explain the high incidence of pneumothorax during needling in this area.
Other traumatic complications, such as subarachnoid haemorrhage, cardiovascular injuries or perforation of the gallbladder, can also be caused by excessively deep needle insertion.
Discussion

The patient’s condition also needs to be considered.

Cardiovascular trauma occurred most frequently in patients with cardiomegaly.

Patients with abdominal pain that has no clear diagnosis are at increased risk of trauma or infection from acupuncture at abdominal acupoints.

Symptomatic treatment of abdominal pain with acupuncture can also delay effective therapy.

During needling at peripheral acupoints on the legs, arms and face, manipulation should be carefully executed to avoid damaging nerves and blood vessels.
Conclusion

Various types of acupuncture-related adverse events have been reported in China.

Similar events have been reported by other countries, usually as a result of inappropriate technique.

Acupuncture can be considered inherently safe in the hands of well trained practitioners.

However, there is a need to find effective ways to improve the practice of acupuncture and to monitor and minimize the health risks involved.
Report of adverse event with electroacupuncture

Abstract

Electroacupuncture (EA) is becoming more common as a treatment for chronic musculoskeletal pain. It can be associated with adverse events related to the small electric currents used, in addition to the adverse events related to needle penetration of tissues. This paper reports a case of minor tissue damage following high intensity EA for 30 min with a device delivering a waveform that does not appear to be completely charge-balanced. This case highlights a rare but preventable adverse event. Manufacturers should be encouraged to develop EA stimulators that use charge-balanced waveforms.
Vasovagal response
Thank you

Any question