

* If we do repetitive stimulation in very low rate this will produce sensitive response / sensitive simple muscle twitch - with time there will be Fatigue (إعياء) is characterized by gradual decrease in the amplitude of the simple muscle twitch and gradual increase in the duration of S.M.T. → with time there will be Failure of relaxation + contraction

في حالة الإعياء (إعياء) في العضلات (إعياء)

Why this is happen?? Fatigue إعياء

neuro muscular إعياء في العضلات -

- then the Fatigue will occur in the muscle and lastly it occur in n.f, these fatigue are psychological organic. (we have another type of Fatigue: which is Si)

* organic Fatigue → How can prove that?

كيف نثبت الإعياء العضلي؟ نمى في العضلات

directly إعياء و n.f إعياء stimulator إعياء

if it is contracte it mean that there is no transmission from the nerve to the muscle so

that to prove it → Fatigue occur at the n.m.

we give stimulation to the muscle directly then there when إعياء & q.b there will be decrease in the amplitude

and ↑ duration

at this time to prove that the nerve is still active we do stimulation of the nerve and recording the electrical activity from the other side we find that the nerve still its function

∴ First → N.M.j then → n.F

(2)

Fatigue. \sim \sim Ach up \sim \sim ATP \sim \sim

S energy \sim complete relaxation

When we do stimulation there will be influx of sodium and the sodium is extruded outside the cell by $\text{Na}^+ - \text{K}^+$ pump \rightarrow in Fatigue there is no ATP \rightarrow no repolarization \downarrow need energy

④ Thermal changes:

* if we do isometric we have Activation heat
isotonic \rightarrow shortening heat

* Relaxation reaction $\xrightarrow{\text{heat}}$ ATP $\xrightarrow{\text{Chemical}}$ heat

Subject

The maximum amount of the heat occurring during contraction of the muscle

Date

No.

There is 2 type of relaxation:

active heat

shortening heat

① when we drop down our hand → passive
this is minimum amount of heat

→ because there is no much activity in the muscle

② Active → we are producing more amount of heat

Smooth muscle

→ vary from skeletal muscle in shape + property and function.

- involuntary → dew nerve al gail lil

③

- myogenic → cub. n. F → not paralysis

* 2 type →

① multi unit → each muscle fiber is separated from the other while ② unitary each muscle is connected with adjacent m. f.

Fati'is i'is is i'is smooth is i'is

unitary

* Gap junction → Found in between 2 adjacent cells and form mechanical connection

* Doesn't contain only gap junction containing
 $Ca^{+} / K^{+} / Na^{+}$ channel.

* multi unit \rightarrow arteriole found in multi unit
because we are able to increase the blood flow
to capillary or decrease it, we are able to increase
or decrease blood pressure and this occurs through
multi unit.

\rightarrow Sphincters \rightarrow we should regulate its
function.

(4)

Tone in \rightarrow smooth muscle is not stable
 \rightarrow How can urenation occur?

Excitation of the smooth muscle sometime
produce contraction sometime produce
relaxation.

Parasympathetic \rightarrow contraction

Sympathetic \rightarrow relaxation

in 2 side \leftarrow this is how it works.

e.g. \rightarrow during urenation we should contract
the bladder and relax \rightarrow sphincters

انواع مستقبلات عند حدوث افرغين (خوف وفهد)
types of receptor

$\alpha \rightarrow$ vaso contraction

$\beta \rightarrow$ vaso dilution

* Sympathetic \rightarrow stimulation \rightarrow increase in rhythm
parasympathetic stimulation \rightarrow decrease in rhythm

in another tissue \rightarrow ↑

Sympath \rightarrow decrease

para \rightarrow increase.

In smooth muscle the R.M.p is not stable
(-70-50mV)

in the same cell it will occur unstable R.M.p

Basal electrical rhythm \rightarrow unstable R.M.p

الاسان ريع ال A.p ريع ال rhythm ال muscle
Smooth ال muscle

✓ rhythm depends on Basal electrical rhythm
not on the A.p that occur in the top of
wave

Why the R.M.P. Unstable in SM?

In SM. has selective permeability + unequal distribution of electrolyte + Na^+ - K^+ pump but
⊗ due to small SM there will be shift in R.M.P.
size

Pace Maker \rightarrow pacis

\rightarrow it has higher rate of discharge of A.P

ⓑ Pacemaker A.P \rightarrow there is a cell which produce contraction before rate

ⓐ Stimulation \rightarrow in the nerve fiber the stimulation should occur through electrical stimulation changes but in SM \rightarrow electrical changes is not so important. the most important is chemical changes + Mechanical.

Thermal is more important than electrical

Chemical \rightarrow Mechanical \rightarrow Thermal \rightarrow electrical

$\xrightarrow{\text{less affect}}$

troponin or tropomyosin لا يمكن SM على أن
S myosin ترتبط على ال actin لا

In smooth muscle there is no phosphorylation
no high energy phosphate → in order to get
binding between actin and myosin we should
produce phosphorylation.

① myosin light chain kinase enzyme will
produce phosphorylation to myosin head
التي يمكنها أن ترتبط على ال actin

لا يمكن → ال actin