ACT

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Determining heparin dosage for cardiopulmonary by pass using Activating clotting time

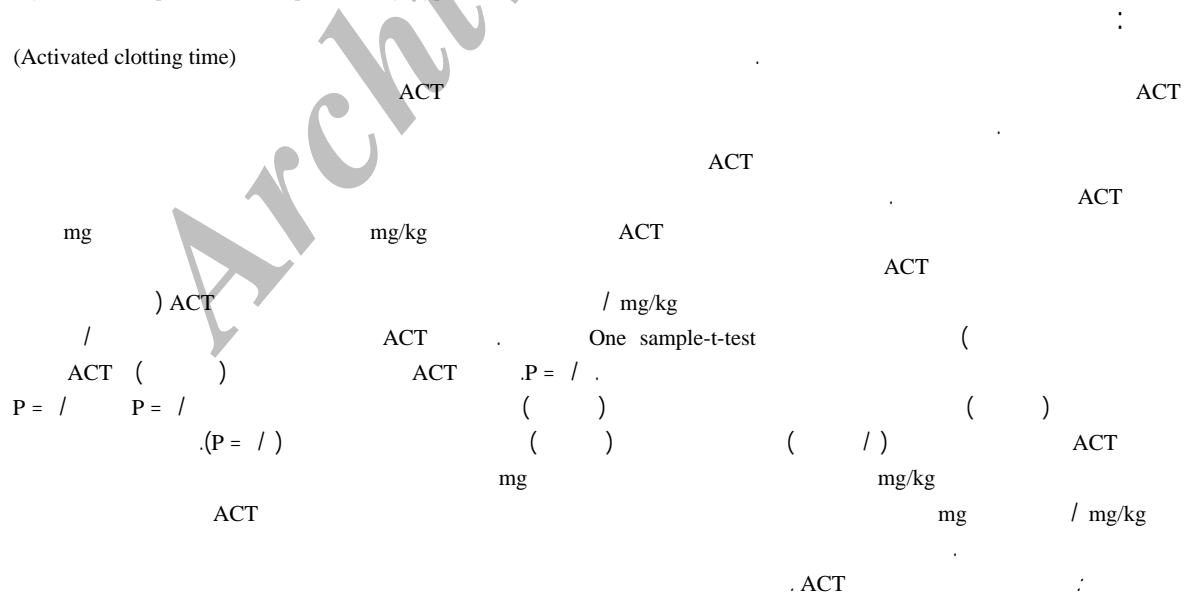Mirinezhad M.M. [1],*, Kolahdozan Kh.[2], Aidi M.[3], Ghorbanian N.[2], Abediny N.[3]
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Abstract: The purpose of this study was to evaluate the validity routine methods of heparin administration and neutralizing its effects by protamine in patients who underwent the open heart surgery using Cardiopulmonary Bypass (CPB) technique, in the comparison of administered amount of this agent through the classical methods, by controlling the ACT (Activated clotting time). In the classical way, the maintenance of heparin and protamine doses are determined and injected according to the ACT-heparin curve. The subjects of this study were 100 patients who underwent surgery of coronary vessel graft (68%), valve replacement (28%) and repairing congenital defects (4%) and the CPB was conducted on them. After conventionally taking the ACT as control, 3mg/kg heparin was injected and per hour 50mg maintained doses were administered. The Act specimens were collected after the injection of heparin and also at the end of CPB before protamine injection. The fourth sample of Act was collected after neutralizing the heparin effects by 4.5mg/kg of protamine. The results of 4 ACT samples were analyzed with expected and standard values (Control Act = 120 sec and Act during pumping>400 sec) by One Sample t-test. There was no significant difference between the average control Act of the patients before heparin injection (128.8 sec) and the normal value of 120 sec (P=0.2), while there was significant difference between average Act after heparin injection (572 sec) and Act value before protamine injection (599 sec) and the expected value of 400 sec during CPB (P=0.0001 and P=0.0001, respectively). There was also no significant difference between average Act after protamine injection (124.9 sec) and the normal value of 120 sec.It is revealed in this paper that when the Act procedure is not available, the routine method of 50mg heparin injection per hour and neutralizing the heparin effects by 1.5mg doses of protamine per each mg of injected heparin, possesses the necessary validity and it may be practical for the patients.

***Key words:** Heparin, Cardiopulmonary bypass, ACT*.

:

(Activated clotting time)   .

ACT   ACT

.

ACT

.   ACT

mg   mg/kg   ACT

ACT

) ACT   / mg/kg

/   ACT   .   One sample-t-test   (

ACT   (   )   ACT   .P = / .

P = /   P = /   (   )   (   )

.(P = /)   (   )   (/)   ACT

mg   mg/kg

ACT   mg   / mg/kg

.

. ACT   :

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.( )   /   (   )

CPB

/ lit/min

/

( )

CO_2
.   (   )

CPB

.( )

III

.

(   )

.

.

...

.

CPB   .

ACT

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1. CardioPulmonarybypass

(   )   ( )   Hatters leg

            /   .

            CPB   ACT

                                                            ACT .   CPB

                                                ACT   (±)

        .   ACT

    ACT

    /   .

                                            ACT   ACT

                            ACT   ACT

        –   .   ACT

                                    .

                    ACT

/ mg/kg   A

        B   ACT

ACT

                                                                    ((

                    ACT   (ACT   -

)   (

    ACT=   (ACT   .

                    .)   C   ACT

ACT in Sec

ACT   –   :

(One sample-t-test)

.

( ) ACT   ACT

ACT =

) ACT

(CPB   -   ACT

ACT =

CPB) ACT   (D)

(A D   ACT

ACT =   C   B D   ACT

) ACT   .( )

ACT =   (

ACT

(Prospective)

CPB   mg   CPB   mg/kg   CPB

/ mg

.

. ACT   (ACT

ACT

(.   mg/kg

ACT ( )   ACT

. ( )   ( )

mg   ACT

ACT   (.

P = / > / .   CPB

ACT

ACT :   / mg)   / mg/kg

ACT ( )   (.   (

( )   ACT

( )

ACT

CPB

ACT   .

ACT

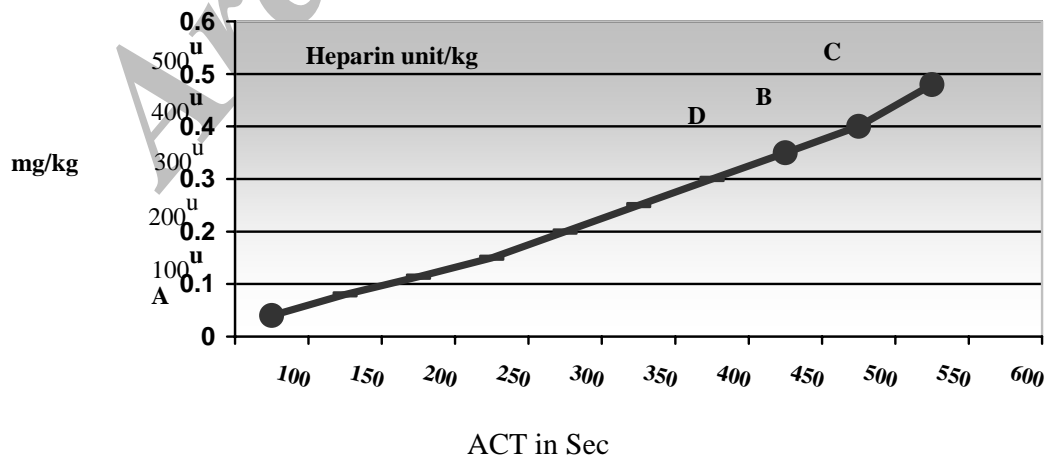(/ mg   )   ACT
ACT   ACT   ACT
              ACT   .   CABG
        SD =   / "   =   /   P = %   > % .
ACT   P = /   > /   ACT
ACT =   "   .

        ACT

                                  .

ACT(SD)   :
P = %   > %
ACT
(   )   CABG
(   )

ACT

                                                                (ACT   )
                                                        ACT

                    ACT   ACT =

                                                (±)

One sample-t-   ACT
        /   ACT   test

        mg/kg   P = /   > %   /
/ mg/kg   CPB   ACT

                                                                    .   ACT
                                                ACT   (^{u}/kg   ) mg/kg
                                                ACT

        CPB   "   ACT

                          ACT   .   ACT>
.   Meen =   "
                                            SD =   "
    mg/kg   P = /   < /
(   )   ACT   ACT
    mg   ACT>   "
                                            Meen =   "
                          ACT   SD =   "
        .   P = /   < /
                    ACT
    (/ mg) / mg/kg
ACT   / mg/kg

(   )

ACT

ACT

(−ACT   )

.

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(CPB)   .   .

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