How long does it take to shock again?

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Purpose of the study

To study the time interval between consecutive shocks in OHCA when ACLS is provided as an indirect indicator of time management during CPR cycles according to 2015 ERC Guidelines.

Material and methods

Descriptive, observational, retrospective study.

Study period: January 1st 2014 to December 31st 2016.

We define event as the presence of ventricular fibrillation (VF) for at least 3 consecutive rhythm analyses.

Other studies have defined CPR cycle time in 120 s, optimal rhythm check time in 4 s, time to charge the defibrillator up to 200 J in 8 s and shock delivery and resuming CPR in 1 s (figure 1); therefore, the optimal time in between shocks is 133 s.

We define, for analysis, an optimal time range between 133-146 s.

Inclusion criteria: OHCA with one or more events and event log available assisted by SAMU-Asturias.

Figure 1. Minimum interval times needed

Data collected from clinical records, both in paper and digital, and event log from the monitor/defibrillator Lifepak 15®.

Statistical analysis with SPSS Statistics 21 software.

Results

Out of 1706 OHCA registered by the EMS, 114 meet inclusion criteria, with 127 events and 680 time intervals between shocks.

Figure 2 and table I show the frequency of the different intervals, defined in minutes and in groups of 10 seconds, between shocks. Mean interval between them is 134,1 s (SD= 49,9 s).

TABLE I: Time between shocks

Interval	n	Rate
00'00" - 00'59"	52	7.6%
01'00" - 01'59"	180	26.5%
02'00" - 02'59"	338	49.7%
03'00" - 03'59"	87	12.8%
04'00" - 04'59"	23	3.4%

Figure 2. Time between shocks (in groups of 10 sec)

15.9% of intervals between shocks are in the optimal time range (table II).

TABLE II: Shocks in optimal time range

Time	n	Rate
Less than 133 seconds	369	54.2%
133 - 146 seconds	108	15.9%
More than 146 seconds	203	29.9%

Conclusions

- The optimal time range rate can be considered an indirect indicator of CPR quality.
- Most of shocks are delivered in the 2 to 3 min interval.
- Our optimal time range rate seems to be very low, though there are no standards to compare with.
- Our study shows higher rates of time below the lower limit of the optimal time range.
- Time control measures must be implemented during ACLS in OHCA.

Bibliography:

1. Perkins GD et al. ERC Guidelines for Resuscitation 2015: Section 2. Adult basic life support and automated external defibrillation. Resuscitation. 2015 Oct;95:81-99.
2. Hayashi Y, Hiraide A, Morita H, Shinga H, Nishiuchi T, Mukainaka S et al. An analysis of time factors in out-of-hospital cardiac arrest in Osaka Prefecture. Resuscitation 2002 May;53(2):121-5.
3. Deakin CD, Koster RW. Chest compression pauses during defibrillation attempts. Curr Opin Crit Care 2016 Jun;22(3):206-11.