

Monocyte subset distribution and surface expression of HLA-DR and CD14 in patients after cardiopulmonary resuscitation

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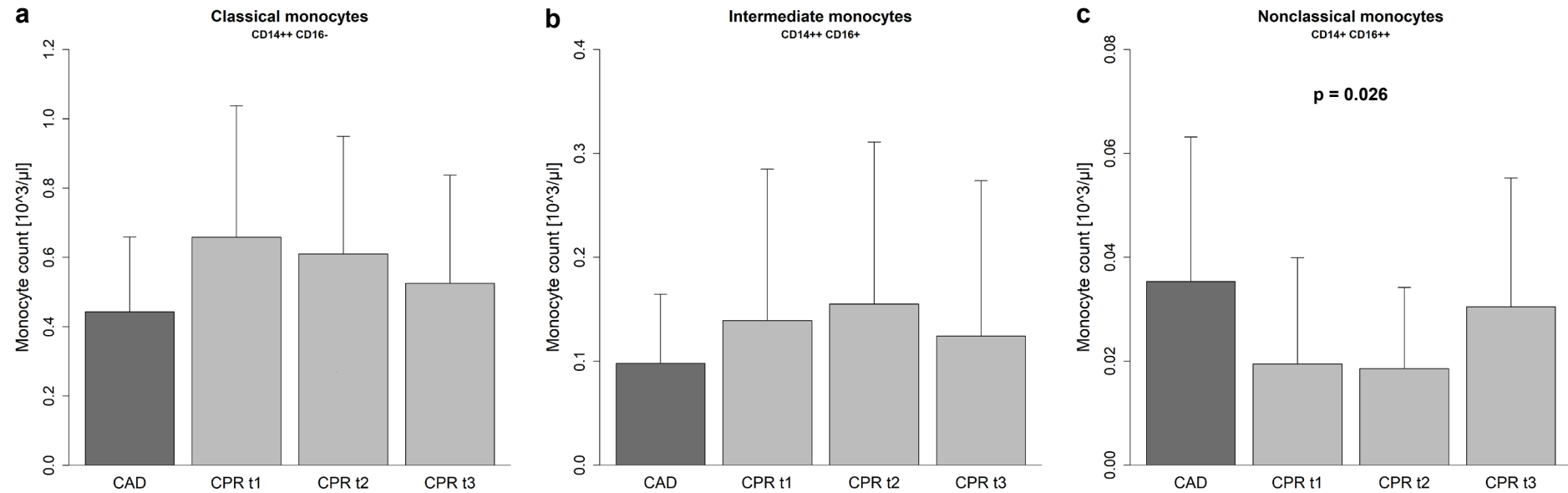
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Supplementary Figure S1: Absolute monocyte subset count in resuscitated patients and the control group.



Shown is the absolute count of monocyte subsets from the CPR group in the first 12 h (CPR t1: $n = 22$), after 24 h (CPR t2: $n = 21$) and 48 h (CPR t3: $n = 16$) following ROSC, and the control group (CAD: $n = 19$). Statistical hypothesis testing was performed using the Kruskal-Wallis test. The Kruskal-Wallis test indicated a significant difference in the number of nonclassical monocytes between the four groups ($p = 0.026$). Post-hoc analysis with all-pairwise comparisons using the Dunn-Bonferroni approach showed only a trend to lower numbers of nonclassical monocytes in the first 12 h (CPR t1 vs CAD group, $p = 0.068$) and after 24 h following ROSC (CPR t2 vs CAD group, $p = 0.157$). However, when post-hoc multiple comparisons with the Dunn's approach were applied, where the means of every column in the CPR group were compared only to the control group, we did observe a significant lower count of nonclassical monocytes in the first 12 h (CPR t1 vs CAD group, $p = 0.034$) and a trend to lower numbers of nonclassical monocytes at 24 h following ROSC (CPR t2 vs CAD group, $p = 0.078$).

Supplementary Table S2: Spearman's rank correlation between monocyte subset composition and clinical characteristics

			Time to ROSC	Time to CPR	CPC (3-5)	30-day mortality	SOFA score	SAPS II score	APACHE II score	CAHP score	OHCA score	Nor- epinephri ne [mg/h]
CD14 ⁺⁺ CD16 ⁻ [%]	T1	r _s :	-0.157	0.013	-0.040	-0.050	-0.293	-0.067	0.041	0.116	0.122	0.174
		p:	0.509	0.957	0.836	0.829	0.186	0.767	0.856	0.618	0.599	0.438
	T2	r _s :	-0.414	0.054	0.295	-0.017	0.178	0.079	0.434	-0.208	-0.282	0.040
		p:	0.062	0.818	0.194	0.943	0.440	0.734	0.049	0.380	0.228	0.862
	T3	r _s :	0.065	-0.091	-0.280	-0.451	0.378	-0.177	0.342	-0.042	0.044	0.407
		p:	0.812	0.738	0.293	0.080	0.165	0.513	0.194	0.887	0.881	0.132
CD14 ⁺⁺ CD16 ⁻ [10 ³ /μl]	T1	r _s :	0.032	-0.103	-0.080	-0.467	0.295	-0.364	-0.170	-0.083	-0.306	0.159
		p:	0.892	0.666	0.730	0.033	0.183	0.096	0.451	0.720	0.178	0.480
	T2	r _s :	0.154	-0.048	0.018	-0.234	-0.320	-0.025	0.245	0.057	-0.104	-0.087
		p:	0.505	0.838	0.937	0.308	0.157	0.915	0.285	0.811	0.663	0.708
	T3	r _s :	-0.480	0.057	0.308	0.096	0.372	0.320	0.243	-0.051	-0.082	0.239
		p:	0.060	0.834	0.246	0.725	0.172	0.228	0.365	0.864	0.781	0.390
CD14 ⁺⁺ CD16 ⁺ [%]	T1	r _s :	0.140	-0.076	0.020	0.067	0.336	0.032	-0.072	-0.097	-0.117	-0.202
		p:	0.555	0.749	0.931	0.774	0.126	0.888	0.749	0.674	0.613	0.366
	T2	r _s :	0.485	-0.049	-0.305	-0.008	-0.221	-0.093	-0.449	0.240	0.279	-0.064
		p:	0.026	0.832	0.179	0.971	0.335	0.689	0.041	0.308	0.234	0.784
	T3	r _s :	-0.016	-0.222	0.028	0.232	-0.247	0.244	-0.452	-0.090	-0.155	-0.268
		p:	0.953	0.408	0.918	0.387	0.374	0.361	0.078	0.759	0.597	0.334
CD14 ⁺⁺ CD16 ⁺ [10 ³ /μl]	T1	r _s :	0.079	0.048	0.140	-0.067	0.416	-0.122	-0.123	-0.012	-0.128	-0.223
		p:	0.740	0.840	0.544	0.774	0.054	0.589	0.584	0.960	0.582	0.319
	T2	r _s :	0.598	-0.066	-0.203	-0.050	-0.260	-0.207	-0.245	0.301	0.324	-0.104
		p:	0.004	0.778	0.377	0.829	0.255	0.367	0.284	0.198	0.164	0.654
	T3	r _s :	-0.341	-0.156	0.336	0.342	0.259	0.343	-0.179	-0.095	-0.175	0.007
		p:	0.196	0.564	0.203	0.195	0.352	0.193	0.508	0.748	0.550	0.980
CD14 ⁺ CD16 ⁺⁺ [%]	T1	r _s :	-0.135	0.388	0.360	0.100	0.212	0.099	0.174	-0.077	-0.019	-0.039
		p:	0.570	0.091	0.108	0.666	0.344	0.662	0.440	0.741	0.935	0.863
	T2	r _s :	-0.287	0.194	-0.074	0.167	0.015	-0.140	-0.233	0.003	-0.044	0.221
		p:	0.207	0.399	0.750	0.470	0.950	0.546	0.310	0.990	0.855	0.336
	T3	r _s :	-0.043	0.237	0.252	0.396	-0.557	0.230	0.113	0.226	0.075	-0.250
		p:	0.875	0.377	0.346	0.129	0.031	0.392	0.677	0.436	0.798	0.369
CD14 ⁺ CD16 ⁺⁺ [10 ³ /μl]	T1	r _s :	-0.152	0.258	0.340	-0.067	0.487	-0.251	-0.083	-0.068	-0.217	-0.032
		p:	0.521	0.271	0.131	0.774	0.021	0.260	0.715	0.771	0.346	0.889
	T2	r _s :	-0.051	0.066	-0.111	-0.050	-0.306	-0.167	-0.090	0.015	-0.096	-0.013
		p:	0.827	0.778	0.633	0.829	0.177	0.470	0.697	0.950	0.686	0.955
	T3	r _s :	-0.359	0.508	0.476	0.396	-0.306	0.449	0.252	0.305	0.246	-0.018
		p:	0.172	0.044	0.062	0.129	0.268	0.081	0.347	0.288	0.397	0.950

Correlation analyses of clinical characteristics in the CPR group and monocyte subset composition during the first 12 h (CPR t1; n = 22), after 24 h (CPR t2; n = 21), and 48 h (CPR t3; n = 16) following ROSC are shown. One patient was lost to follow-up after study enrollment. Statistical hypothesis testing was performed using Spearman's rank correlation, the result of which is reported as Spearman's rho (r_s) and the p -values listed above. CAHP and OHCA score were only calculated in patients after out-of-hospital cardiac arrest.

Time to ROSC, time from collapse to return of spontaneous circulation; Time to CPR, time from collapse to cardiopulmonary resuscitation; SOFA score, Sequential Organ Failure Assessment score; SAPS II score, Simplified Acute Physiology Score II, APACHE II score, Acute Physiology and Chronic Health Evaluation II score; CAHP score, Cardiac Arrest Hospital Prognosis score; OHCA score, Out-of-Hospital Cardiac Arrest score; Norepinephrine [mg/h], dose of norepinephrine, which was necessary to maintain a mean arterial blood pressure ≥ 80 mmHg

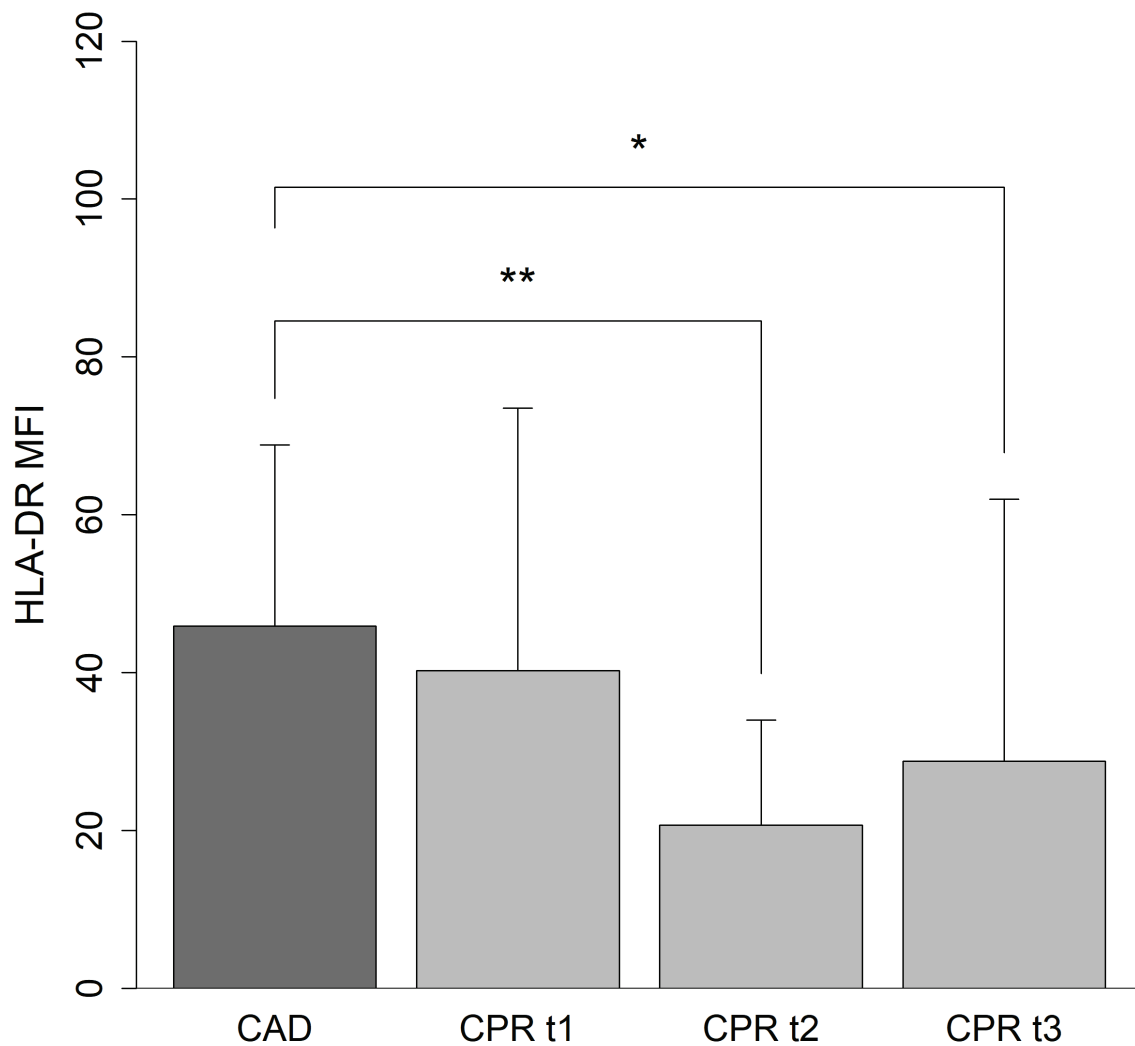
Supplementary Table S3: Spearman's rank correlation of CD14 and HLA-DR expression with clinical characteristics

			Time to ROSC	Time to CPR	CPC (3-5)	30-day mortality	SOFA score	SAPS II score	APACHE II score	CAHP score	OHCA score	Nor-epinephrine [mg/h]
CD14 MFI	T1	r_s :	0.006	0.024	-0.240	-0.217	0.273	-0.264	-0.092	-0.236	-0.204	-0.049
		p :	0.980	0.920	0.294	0.345	0.220	0.236	0.685	0.302	0.376	0.830
	T2	r_s :	0.650	-0.243	-0.277	-0.100	-0.012	-0.145	0.016	0.176	0.288	-0.256
		p :	0.001	0.289	0.224	0.666	0.959	0.530	0.946	0.458	0.218	0.263
	T3	r_s :	-0.028	0.036	0.196	0.096	0.009	-0.467	0.064	0.099	0.217	-0.300
		p :	0.918	0.896	0.467	0.725	0.973	0.068	0.814	0.737	0.457	0.277
HLA-DR MFI	T1	r_s :	-0.247	-0.105	-0.300	-0.367	-0.215	0.150	-0.348	-0.352	-0.241	-0.235
		p :	0.295	0.658	0.186	0.102	0.337	0.505	0.113	0.118	0.293	0.293
	T2	r_s :	0.110	-0.185	-0.222	-0.184	-0.256	-0.438	-0.393	-0.192	-0.081	-0.474
		p :	0.635	0.423	0.334	0.426	0.263	0.047	0.078	0.416	0.736	0.030
	T3	r_s :	-0.249	-0.549	-0.126	0.027	-0.070	-0.234	-0.681	-0.704	-0.751	-0.688
		p :	0.353	0.028	0.642	0.920	0.804	0.384	0.004	0.005	0.002	0.005
HLA-DR MFI CD14 ⁺ CD16 ⁻	T1	r_s :	-0.271	-0.083	-0.300	-0.317	-0.260	0.178	-0.280	-0.310	-0.187	-0.181
		p :	0.247	0.728	0.186	0.162	0.242	0.428	0.207	0.171	0.418	0.420
	T2	r_s :	0.097	-0.210	-0.222	-0.200	-0.299	-0.306	-0.250	-0.106	-0.052	-0.470
		p :	0.675	0.361	0.334	0.384	0.188	0.177	0.274	0.656	0.829	0.031
	T3	r_s :	-0.390	-0.606	-0.112	-0.041	0.148	-0.229	-0.658	-0.805	-0.807	-0.584
		p :	0.136	0.013	0.679	0.880	0.599	0.394	0.006	0.001	0.000	0.022
HLA-DR MFI CD14 ⁺ CD16 ⁺	T1	r_s :	-0.364	-0.307	-0.360	-0.484	-0.206	0.117	-0.092	-0.666	-0.557	0.071
		p :	0.115	0.189	0.108	0.026	0.357	0.605	0.685	0.001	0.009	0.753
	T2	r_s :	-0.311	-0.255	0.092	-0.100	-0.188	-0.263	-0.225	-0.517	-0.547	-0.404
		p :	0.170	0.265	0.691	0.666	0.414	0.250	0.327	0.020	0.012	0.069
	T3	r_s :	-0.211	-0.486	-0.238	-0.246	0.318	-0.424	-0.593	-0.726	-0.659	-0.336
		p :	0.434	0.056	0.374	0.358	0.247	0.101	0.016	0.003	0.010	0.221
HLA-DR MFI CD14 ⁺ CD16 ⁺⁺	T1	r_s :	-0.329	-0.227	-0.320	-0.500	-0.108	0.075	-0.078	-0.579	-0.433	-0.101
		p :	0.157	0.336	0.157	0.021	0.633	0.739	0.730	0.006	0.050	0.656
	T2	r_s :	0.201	-0.552	-0.499	-0.400	-0.033	-0.190	-0.325	-0.362	-0.230	-0.300
		p :	0.383	0.009	0.021	0.072	0.889	0.410	0.150	0.116	0.330	0.186
	T3	r_s :	0.219	-0.667	-0.504	-0.478	0.142	-0.551	-0.534	-0.776	-0.615	-0.139
		p :	0.415	0.005	0.046	0.061	0.615	0.027	0.033	0.001	0.019	0.621

Correlation analyses of clinical characteristics in the CPR group and monocyte surface expression of CD14 and HLA-DR during the first 12 h (CPR t1; n = 22), after 24 h (CPR t2; n = 21), and 48 h (CPR t3; n = 16) following ROSC are shown. One patient was lost to follow-up after study enrollment. Statistical hypothesis testing was performed using Spearman's rank correlation, the result of which is reported as Spearman's rho (r_s) and the p -values listed above. CAHP and OHCA score were only calculated in patients after out-of-hospital cardiac arrest.

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Supplementary Figure S4: HLA-DR surface expression on circulating monocytes of patients after cardiac arrest and the control group.



The surface expression of HLA-DR (expressed as median fluorescence intensity) on circulating monocytes of patients during the first 12 h (CPR t1; n = 22), after 24 h (CPR t2; n = 21), and 48 h (CPR t3; n = 16) post ROSC and of patients from the control group (CAD; n = 19) is shown. Statistical hypothesis testing was performed using the Kruskal-Wallis test and post-hoc analysis with all-pairwise comparisons using the Dunn-Bonferroni approach (*: $p \leq 0.05$; **: $p \leq 0.01$).