

COVID Monkeys

HRV Analysis

September 12, 2020

Introduction

- ▶ ECG analysis of monkeys with COVID
- ▶ HRV performed of available signal
- ▶ Monkeys all have SARS-CoV2 infection, half were treated with anti-inflammatories

Quality of Signal Processing Efforts

Table 1: Best quality per session/lead

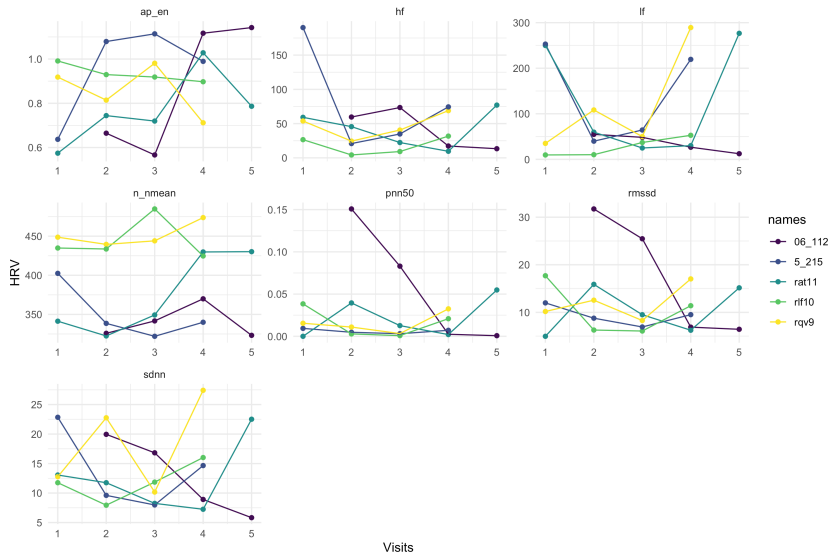
session	names	visit	lead	tot_wind	percent_not_analyzed
1	rat11	1	LII	58	0.0
2	06_112	1	NA	NA	NA
3	rat11	2	LII	58	19.0
4	06_112	2	LII	52	71.2
5	rat11	3	LII	58	27.6
6	06_112	3	LII	58	48.3
7	06_112	4	aVF	30	0.0
8	rat11	4	LI	70	24.3
9	5_215	1	aVF	18	0.0
10	rqv9	1	aVF	54	0.0
11	r1f10	1	aVF	37	2.7
12	06_112	5	aVF	127	0.0
13	rat11	5	aVF	135	0.0
14	5_215	2	aVL	72	0.0
15	rqv9	2	aVF	57	0.0
16	r1f10	2	aVF	121	0.0
17	r1f10	3	aVF	73	0.0
18	rqv9	3	aVF	42	0.0
19	rqv9	4	aVF	75	0.0
20	5_215	3	aVF	25	0.0
21	5_215	4	Vx	54	0.0

HRV Findings

session	NN	SDNN	RMSSD	PNN50	HF	LF	APEN
1	341	13.06	4.96	0.000	59.17	249.83	0.575
3	323	11.75	15.89	3.951	45.58	59.66	0.744
4	326	19.95	31.74	15.081	59.62	54.85	0.665
5	349	8.25	9.50	1.266	22.37	24.90	0.720
6	342	16.82	25.47	8.304	73.46	48.28	0.567
7	370	8.91	6.88	0.243	17.30	26.60	1.117
8	430	7.25	6.24	0.208	9.60	30.01	1.028
9	402	22.85	11.99	0.938	190.18	252.91	0.637
10	449	12.77	10.18	1.546	53.81	35.00	0.918
11	435	11.75	17.69	3.841	26.56	9.63	0.991
12	323	5.83	6.43	0.075	13.36	12.36	1.142
13	430	22.52	15.15	5.486	77.02	276.56	0.787
14	339	9.61	8.77	0.477	20.89	39.87	1.079
15	440	22.76	12.55	1.094	24.47	108.38	0.814
16	434	7.94	6.28	0.285	4.25	10.21	0.930
17	485	11.86	6.07	0.079	9.21	36.98	0.919
18	444	10.17	8.28	0.323	40.60	49.93	0.981
19	474	27.42	17.03	3.251	68.92	289.17	0.712
20	322	7.98	6.92	0.307	34.85	64.39	1.114
21	340	14.66	9.51	0.710	74.40	219.41	0.989
22	425	16.02	11.39	2.084	31.75	52.75	0.897

HRV over Repeat Sessions

HRV over repeat visits



Repeat Measures Analysis

hrv	stratum	term	df	sumsq	meansq	statistic	p.value
n_nmean	names	visit	1	1.89e+04	1.89e+04	2.235	0.232
n_nmean	Within	visit	1	1.97e+03	1.97e+03	1.773	0.203
sdnn	names	visit	1	1.46e+01	1.46e+01	0.479	0.539
sdnn	Within	visit	1	2.00e-03	2.00e-03	0.000	0.995
rmssd	names	visit	1	1.16e+02	1.16e+02	5.378	0.103
rmssd	Within	visit	1	6.04e+01	6.04e+01	1.318	0.269
pnn50	names	visit	1	6.00e-03	6.00e-03	18.872	0.023
pnn50	Within	visit	1	1.00e-03	1.00e-03	1.145	0.301
hf	names	visit	1	2.04e+02	2.04e+02	0.079	0.797
hf	Within	visit	1	1.66e+03	1.66e+03	1.070	0.317
lf	names	visit	1	6.18e+03	6.18e+03	0.422	0.562
lf	Within	visit	1	3.88e+03	3.88e+03	0.428	0.523
ap_en	names	visit	1	2.00e-02	2.00e-02	0.804	0.436
ap_en	Within	visit	1	1.17e-01	1.17e-01	3.890	0.067