

Publications 2020-2021 from Our division and Center Faculty

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Publication (chapters)

Geriatrics at Your Fingertips (GAYF) 2021 Coding in Geriatrics

Ham's Primary Care Geriatrics 7th ed Billing and Coding

Geriatric Medicine Fellows – AGS 2021 Virtual Annual Scientific Meeting

Ashna Rajan, MD

Does the use of a beta blocker cause a delay in testing for COVID-19?

A. Rajan,² F. Devone.¹ 1. Providence VA Medical Center, Providence, RI; 2. Brown University, Providence, RI.

Background: COVID-19 (COVID-19)-related mortality in nursing home (NH) residents in the US is rising. Peak temperature (T) is used as a trigger to test for COVID-19 but as a single modality this lacks sensitivity. It is unknown whether exposure to BBs delays testing for COVID-19.

Methods: We retrospectively compared residents in 134 NHs screened for COVID-19 between March and August 2020 based on BBs use. We included residents receiving BBs at the time of COVID-19 testing and for at least 7 days (3 days prior to and 3 days after the test). We evaluated baseline characteristics, average baseline T and heart rate (HR) of the residents who tested positive for COVID-19 and the average difference to maximum HR (maxHR) and T (maxT). Baseline HR and T were the mean of 5 first values. We modeled measures (using pulse/temperature cutoffs) for triggering a COVID-19 test and compared the two groups to assess impact of the number of tests done on the days lost to diagnosis.

Results: Of the 10,761 infected patients, 2,441 were on BBs. The average baseline T was found to be similar in both groups (36.5 degree celsius) while the HR was lower in the BB group (73.9 vs 75.8). The average of peak HRs were 91.03 (no BB) and 89.05 (on BB) while average of peak Ts were 37.29 and 37.23 respectively. The average maximum difference from baseline HR was found to be similar among the 2 groups. However, when hypothetical cutoffs (20/min. rise in HR and 0.4 degree celsius change from baseline) were used, there was an 8% and 11% increase in detection of cases in the BBs group, respectively.

Conclusions: BB use alone did not affect HR or T. If a threshold of 0.4 degree celsius or 20/min. rise in T and HR are respectively used, earlier detection of COVID-19 is possible. It is possible that the incidence of COVID-19 alters the mechanism of action of BBs, causing a sharp rise in T and HR aiding earlier detection. Further research needs to be pursued to determine if HR can be used as a measure for trigger testing in comparison to T in COVID-19 and other infectious diseases.

Marilyne Cadieux, DO

Temperature change following acetaminophen in nursing home residents with and without SARS-CoV-2 infection

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Background: Acetaminophen (APAP) is known to decrease temperature (T). At this time, it is unknown whether APAP affects T differently among those with or without SARS-CoV2 infection (SARS). We aimed to compare temperatures in nursing home residents after APAP in the setting of SARS.

Methods: The study was done in the Veterans Administration nursing homes (NH). Our sample includes residents tested for SARS. We created a subset of patients who have a pair of Ts before and after APAP administration, where the change in T for each pair is defined as ΔT. We only included residents who received APAP as needed for fever or those who had a fever of at least 38°C prior to APAP administration. We used SARS- patients as a control group.

Results: Of 11709 NH residents assessed for SARS between March and September of 2020, 1109 were SARS+. Out of 577,994 vital readings collected, we created 1,355 pairs of Ts, which belong to 708 residents.

Conclusion: A similar reduction in T by 2.27% in SARS+ and by 1.79% in SARS- febrile residents follows APAP administration. This difference was not statistically significant. Therefore, APAP appears to have a similar antipyretic effect in the setting of SARS. A limitation from this study is that the time of T collection and of APAP administration may differ from the time of documentation in the EMR, adding to underlying variance of our assessment. Future studies could use devices measuring continuous T data to further analyse antipyretic trends.

Pre-APAP T	<37.2		37.2-37.5		37.5-38		>38	
SARS status	+	-	+	-	+	-	+	-
N	144	58	130	91	222	151	118	118
Mean ΔT (SD) %	1.55 (2.08)	1.79 (2.17)	-.08 (1.53)	-.29 (1.30)	-.048 (1.79)	-.064 (1.58)	-2.27 (2.30)	-1.79 (2.24)
P-value (95% CI)*	.51 (-.009, .004)		.52 (-.004, .005)		.58 (-.004, .007)		.06 (-.010, .0002)	

*Simple 2-sided z-tests on the mean % change in T

Salaheldin Elhamamsy, MD

Approach to early detection of SARS-CoV2 in nursing homes

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Background

Current nursing home (NH) guidelines for SARS-CoV2 screening using a temperature threshold such as 38°C. More than 70% of SAR-CoV-2 infected NH residents do not meet this criterion. A rate of rise of temperature and change from baseline temperature may improve sensitivity for earlier detection of COVID-19.

Methods

The study was done in the Veterans Administration NHs. SARS-CoV2 screening includes daily temperature checks. We calculated baseline temperatures by averaging the first 5 daily temperatures recorded before SARS-CoV2 was detected.

Results

Of 11,050 VA NH residents tested, SARS-CoV-2 was identified in 1199 (11%). The average maximum temperature in those with SARS-CoV-2 (SARS+) was 38.1 compared with 37.3 in those without SARS-CoV-2 (SARS-) infection. Temperatures in SARS+ began rising 7 days before testing and remained elevated during the 14-day follow-up. Among SARS+ only 50% met the fever threshold of 38°C. Most SARS+ residents (91.55%) experienced 2 or more 0.4°C elevations above their baseline values. One cohort of SARS+ residents (4.23%) temperatures never deviated >0.4°C from baseline.

Temperature elevation >0.4°C from baseline identifies 89% of the SARS+ NH residents; persistent elevation improves detection to 95% of SARS+ residents.

Conclusions

A single screening criterion for temperature is inefficient or insensitive for detecting SARS-CoV-2 in nursing home residents. A patient-derived baseline temperature, persistent rise in temperature can increase sensitivity and lead to early detection of SARS-CoV2 infection in nursing home patients. These results indicate the value of incorporating temperature variation from baseline for early detection and containment of COVID-19.

Change of Temperature Definition	Cumulative Days Earlier Detected	Mean Days Earlier Detected	Missed/Triggered COVID tests (Actual/94,899)	Number of COVID cases instead of 1199 detected
Persistent rise OR TMAX >37.2	1488	1.22	207,533	53 (4%)
Persistent rise OR TMAX >38	1468	1.24	206,887	58 (5%)
0.4 Change from Baseline	830	0.73	107,348	137 (11%)
TMAX >37.2	289	0.17	38,402	273 (23%)
TMAX >38	-253	-0.23	5,612	689 (57%)

Thomas Bayer, MD

Temperature-based Screening for SARS-CoV-2 in Nursing Home Residents with Dementia

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Background: Alzheimer Disease and related dementias (ADRD) may influence expression of temperature variation during viral illnesses due to degeneration of hypothalamic neurons influencing temperature homeostasis. Investigations of body temperature in nursing home (NH) residents have shown that testing for SARS-CoV-2 based on two or more temperature elevations of 0.5°C above baseline temperature (2TE) can improve detection. We compared the sensitivity and specificity of this strategy in NH residents with and without ADRD.

Methods: We retrospectively identified a cohort of individuals who resided in Veterans Administration operated NHs between March 1st, 2020 and August 5, 2020. We used ICD-10 codes from the prior 12 months to identify the patients diagnosed with ADRD. NH staff recorded vital signs including body temperature, and tested residents for SARS-CoV-2 for clinical and infection control purposes.

Results: Our cohort contained 9408 residents, 895 of whom had PCR-confirmed SARS-CoV-2 infection (see table). 2TE occurred in 2515 (44%) of the 5698 residents with ADRD, and in 1616 (44%) of the 3710 residents without ADRD. In residents with ADRD, 2TE had a sensitivity of 0.82 (95% CI 0.79 - 0.85) and a specificity of 0.61 (0.59 - 0.62). In residents without ADRD, 2TE had a sensitivity of 0.80 (0.75-0.85) and a specificity of 0.59 (0.58 - 0.61).

Conclusions: 2TE performed similarly in NH residents with and without ADRD. These results indicate body temperature elevations in residents with SARS-CoV-2 infection are similar with and without ADRD. We will further evaluate the utility of temperature-based selection for who should undergo SARS-CoV-2 testing in NH residents with ADRD using additional statistical techniques taking into account time to diagnosis and time to maximum temperature.

	N	ADRD<2*	ADRD≥2*	nonADRD<2*	nonADRD≥2*	ADRD	nonADRD
total	9408	3183	2512	2094	1616	5698	3710
SARS-CoV-2 +	895	110	512	55	218	622	273
SARS-CoV-2 -	8513	3073	2003	2039	1398	5076	3437

*number of temperature elevations 0.5 C above baseline