ULTRASOUND NEWS

January 2022

Ultraschall Med 2021; 42(06): 623-633
DOI: 10.1055/a-1146-3036

Original Article

Transcranial Sonography Findings in Alzheimer's Disease: A New Imaging Biomarker

Befunde der transkraniellen Sonografie bei Morbus Alzheimer: Ein neuer bildgebender Biomarker

Rezzak Yilmaz, Oliver Granert, Eva Schäffer, Ulf Jensen-Kondering, Sarah Schulze, Thorsten Bartsch *, Daniela Berg *

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Abstract

Objective To validate transcranial sonography (TCS) as a novel imaging tool for the assessment of medial temporal lobe (MTL) atrophy (MTA).

Materials and Methods Participants with Alzheimer's disease (AD, n = 30) and age-sex-matched controls (n = 30) underwent TCS and MRI. On TCS, MTL structures (choroidal fissure (CF) and temporal horn (TH)) were measured and combined to create an MTA score in sonography (MTA-S). Furthermore, both THs and the third ventricle were combined to form the ventricle enlargement score in sonography (VES-S). On MRI, the MTL was evaluated by linear measurements, MTA scale and hippocampal volumetry. Validation was performed by comparing imaging methods and the patient group.

Results Intraclass correlations for CF and TH showed substantial intra/inter-rater reliability (> 0.80). TCS and MRI showed strong to moderate correlation regarding TH (right = 0.88, left = 0.89) and CF (right = 0.70, left = 0.47). MTA-S correlated significantly with the hippocampal volume (right = –0.51, left = –0.47), predicted group membership in logistic regression (Exp(B) right = 3.0, left = 2.7), and could separate AD patients from controls (AUC = 0.93). An MTA-S of 6 mm and 10 mm discriminated MRI MTA scores 0–1 (from 2–4) and MTA score 4 (from 0–3) with 100 % specificity, respectively. VES-S also showed a moderate correlation with the hippocampal volume (r = –0.66) and could differentiate AD patients from controls (AUC = 0.93).

Conclusion Our results suggest that TCS may be an alternative imaging tool for the assessment of MTL atrophy and ventricular enlargement for patients in whom MRI scanning is not possible. Additionally, TCS offers a practical, patient-friendly and inexpensive option for the screening and follow-up of individuals with AD.

The Early Sonographic Prediction of Gestational Diabetes in Women From India

Shivani Gupta, MS, Arjun Gupta, MBBS, C. P. Swarnakar, MD, more...

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First Published August 17, 2021 | Research Article | Check for updates

https://doi.org/10.1177/87564793211029882

Article information

Altmetric 0

Original Article: JDMS Article - SDMS CME Credit

Abstract

Objective:

The purpose of this study was to look for the earliest, cost -effective method that can be added to the routine antenatal screening for identifying patients who might develop gestational diabetes mellitus (GDM) in a proactive manner, as opposed to the current reactive approach of screening and treating GDM, during the second trimester of pregnancy.

Results:

Body mass index was found to have a significant association in those patients with GDM with a $P <$ .001. There was a significant association between subcutaneous adipose tissue (SAT) depth and occurrence of GDM, with a *P*-value of <.001. Also, in the present study, the occurrence of GDM significantly increased with a rise in visceral adipose tissue (VAT), and there was a significant association between the two, with $P < .001$. It was noted that there were greater incidences of GDM as VAT depth increased. The existence of GDM greatly increased with a rise in total abdominal tissue (TAT), and there was a significant association between the two, with $P < .001$

Results:

Body mass index was found to have a significant association in those patients with GDM with a $P <$ .001. There was a significant association between subcutaneous adipose tissue (SAT) depth and occurrence of GDM, with a *P*-value of <.001. Also, in the present study, the occurrence of GDM significantly increased with a rise in visceral adipose tissue (VAT), and there was a significant association between the two, with $P < .001$. It was noted that there were greater incidences of GDM as VAT depth increased. The existence of GDM greatly increased with a rise in total abdominal tissue (TAT), and there was a significant association between the two, with $P < .001$

Conclusion:

The sonographic measurement of SAT, VAT, and TAT, could be potential marker to identify probable events for the development of GDM, among Asian Indian women who tend to have T2DM, due to differential distribution of fat.

Keywords

gestational diabetes, adiposity, diabetes mellitus, pregnant females, antenatal screening

Các khía cạnh an toàn của siêu âm chu sinh

Sicherheitsaspekte des perinatalen Ultraschalls

Ragnar Sande , Klaus-Vitold Jenderka, Carmel M. Moran, Susana Marques, JF Jimenez Diaz, Gail ter Haar, Karel Marsal, Christoph Lees, Jacques S. Abramowicz, Kjell Åsmund Salvesen, Piero Miloro, Andrea Dall'Asta , Christoph Brezinka, Christian Kollmann

An toàn siêu âm có tầm quan trọng đặc biệt trong việc quét thai nhi và trẻ sơ sinh. Các mô của bào thai dễ bị tổn thương và thường vẫn đang phát triển, độ sâu quét có thể thấp và các tác động sinh học tiềm ẩn chưa được nghiên cứu đầy đủ. Mặt khác, lợi ích lâm sàng có thể là đáng kể. Giai đoạn chu sinh có lẽ ít bị tổn thương hơn so với 3 tháng đầu và 3 tháng cuối của thai kỳ, và siêu âm thường là một lựa chọn thay thế an toàn hơn so với các phương thức chẩn đoán hình ảnh khác. Ở đây chúng tôi trình bày các quy trình từng bước để có được các hình ảnh liên quan đến lâm sàng trong khi vẫn duy trì sự an toàn của siêu âm. Chúng tôi thảo luận ngắn gọn về tình trạng hiện tại của lĩnh vực an toàn siêu âm, đặc biệt chú ý đến sự an toàn của các phương thức mới, những cân nhắc về an toàn khi siêu âm được sử dụng cho nghiên cứu và giáo dục, và siêu âm các mô đặc biệt dễ bị tổn thương, chẳng hạn như phổi trẻ sơ sinh. CME này được chuẩn bị bởi ECMUS, ủy ban an toàn của EFSUMB, với sự đóng góp của các bác sĩ sản phụ khoa có mối quan tâm đặc biệt đến an toàn siêu âm.

Ultraschall Med 2021; 42(06): 634-642
DOI: 10.1055/a-1293-8057

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Review

Sonoelastography to Assess Muscular Stiffness Among Older Adults and its Use for the Diagnosis of Sarcopenia: A Systematic Review

Sonoelastografie zur Beurteilung der Muskelsteifheit bei älteren Erwachsenen und ihr Einsatz in der Diagnose der Sarkopenie: Eine systematische Übersichtsarbeit

Ewa Magdalena Janczyk, Noémie Champigny, Emeline Michel, Charles Raffaelli, Cédric Annweiler, Raphael Zory, Olivier Guérin, Guillaume Sacco

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Supported by: Research Center on Autonomy and Longevity, University Hospital of Angers (2019/2020)

› Further Information

› Also available at eRef

Abstract
Changes in muscle stiffness have been reported with sarcopenia. Sonoelastography is an accessible and non-radiating imaging technique allowing quantification of elastic properties of tissue. We performed a systematic review of the literature to investigate whether sonoelastography can be a reliable method to assess sarcopenia in older patients. We searched Medline, Google Scholar, Scopus, SpringerLink and Science direct from January 1, 1990 to April 1, 2020. Three independent review authors assessed trial eligibility, extracted the data, and assessed risk of bias. We intended to learn which types of elastography have been tested, if such measures are repeatable, and if they have been compared to the currently accepted diagnostic method. Ten studies met the inclusion criteria. Most followed a cross-sectional design with young and older adult subgroups. The gastrocnemius, rectus femoris, and vastus intermedius appeared most frequently. Nine of the included studies used shear wave elastography and one-strain elastography. The passive elastic constant was significantly greater in sarcopenic versus healthy subjects after passive stretching (124.98±60.82 vs. 46.35± 15.85, P=0.004). However, even in non-sarcopenic patients, the age of the patient was responsible for about 45.5% of the variance in SWV. Among ten included articles, four reported higher stiffness in the muscles of older adults, two reported lower stiffness, and four found no significant difference. Due to the substantial heterogenicity of actual data, we could not make any conclusions about the potential usefulness of elastography to assess sarcopenia. Further studies are needed, including a larger sample of older patients and using a standardized and reproducible protocol.

Journal of Diagnostic Medical Sonography

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Lung Ultrasonography in Ruling Out COVID-19 Among Health Care Workers in Two Italian Emergency Departments: A Multicenter Study

Roberto Copetti, MD, Giulia Amore, MD, Caterina Anna Giudice, MD, more... Show all authors

First Published August 12, 2021 | Research Article | Check for updates

https://doi.org/10.1177/87564793211037607

Conclusion

In this cohort study, LUS had a good enough negative predictive value for excluding pulmonary disease, due to SARS-CoV2, among health care employees exposed to the virus but with a low prevalence of the disease.

Original Research

Journal of Diagnostic Medical Sonography
2022, Vol. 38(1) 45–51

DOI: 10.1177/87564793211037607
journals.sagepub.com/home/jdm


Lung Ultrasonography in Ruling Out COVID-19 Among Health Care Workers in Two Italian Emergency Departments: A Multicenter Study

Roberto Copetti, MD[1], Giulia Amore, MD[1], Caterina Anna Giudice, MD[1], Daniele Orso, MD[2,3], Silvia Cola, MD[1], Pierpaolo Pillinini, MD[4], Chiara Rocco, MD[4], Dario Cappello, MD[4], Alessia Geneve Dibenedetto, MD[4], and Stefano Meduri, MD[5]

Abstract

Objective: The low sensitivity of the real-time reverse transcription-polymerase chain reaction (rRT-PCR) test on the nasopharyngeal swab for SARS-CoV2 virus could cause infections among health care professionals and could be a source of viral spread. The aim of this study was to verify whether lung ultrasonography (LUS) had a negative predictive value (NPV) high enough to rule out coronavirus disease 2019 (COVID-19) in a cohort of health care employees, working in emergency departments (EDs).

Materials and Methods: A multicenter prospective observational study was conducted in two EDs in Northeast Italy. An adjudication committee established the definitive diagnosis of COVID-19.

Results: A cohort was enrolled of 155 possible patient cases (two true positives). Twenty-one health care employees presented with suggestive symptoms for COVID-19. The rRT-PCR test was positive in one of the two patients. LUS was suggestive for COVID-19 pneumonia in four patients. The diagnostic accuracy of LUS was 98.7% (95% confidence interval [CI] = 95.4%–99.8%). The NPV was 100% (95% CI = 100%–100%).

Conclusion: LUS has a high enough NPV for excluding a COVID-19-related pneumonia in a cohort of health care employees who were exposed to the SARS-CoV2 virus.

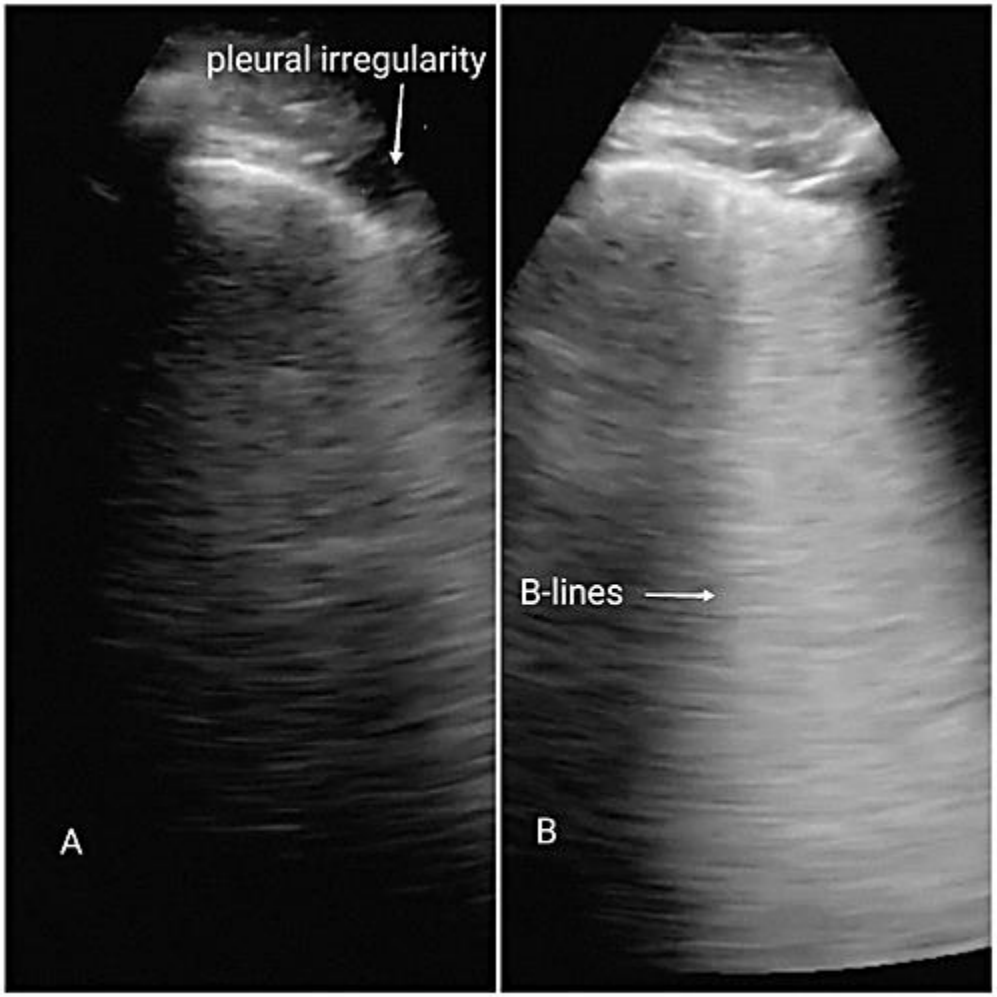

Figure 1. Typical LUS diagnostic findings with COVID-19 pneumonia. (A) Pleural irregularities as anechoic spots that interrupt the pleural line; (B) focal B lines, scattered, sometimes confluent but not homogeneously distributed.

Journal of Diagnostic Medical Sonography

Pain Levels and Injuries by Sonographic Specialty: A Research Study

Amanda Hogan, DBA, RDMS, RDCS, RVT, RT(R)

First Published September 17, 2021 | Research Article | Check for updates
https://doi.org/10.1177/87564793211044122

Conclusion:
According to these study results, reported pain in sonographers is decreasing. Certain specialties within sonography are more prone to injury and higher pain levels.

Pain Levels and Injuries by Sonographic Specialty: A Research Study

Amanda Hogan, DBA, RDMS, RDCS, RVT, RT(R)

First Published September 17, 2021 | Research Article | Check for updates
https://doi.org/10.1177/87564793211044122

Article information

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Original Article: JDMS Article - SDMS CME Credit

Abstract

Objective:

This study aimed to determine whether there was a difference in reported pain and perceived pain levels in different sonography specialties.

Materials and Methods:

An online survey was sent to 28 302 sonographers by the American Registry of Diagnostic Medical Sonography (ARDMS). Sonographers had to be registered and located within the United States to meet inclusion criteria.

Results:

There were 7993 sonographers who completed the questionnaire. The percentage of sonographers who reported scanning in pain across all specialties was 66.25%, with an average pain level of 4.0. The highest pain and injury levels were reported in the cardiac, vascular, and obstetrics/gynecology specialties. Sonographers scanning greater than 18 scans per day or greater than 30 minutes had the highest levels of perceived pain.

Literature Review

Journal of Diagnostic Medical Sonography
2022, Vol. 38(1) 72–84

DOI: 10.1177/87564793211056903
journals.sagepub.com/home/jdm
SAGE

The Role and Challenges of Clinical Imaging During COVID-19 Outbreak

Mustafa Alhasan, PhD[1,2] and Mohamed Hasaneen, PhD[1]

Abstract

Objective: The Radiology department played a crucial role in detecting and following up with the COVID-19 disease during the pandemic. The purpose of this review was to highlight and discuss the role of each imaging modality, in the radiology department, that can help in the current pandemic and to determine the challenges faced by staff and how to overcome them.

Materials and Methods: A literature search was performed using different databases, including PubMed, Google scholar, and the college electronic library to access 2020 published related articles.

Results: A chest computed tomogram (CT) was found to be superior to a chest radiograph, with regards to the early detection of COVID-19. Utilizing lung point of care ultrasound (POCUS) with pediatric patients, demonstrated excellent sensitivity and specificity, compared to a chest radiography. In addition, lung ultrasound (LUS) showed a high correlation with the disease severity assessed with CT. However, magnetic resonance imaging (MRI) has some limiting factors with regard to its clinical utilization, due to signal loss. The reported challenges that the radiology department faced were mainly related to infection control, staff workload, and the training of students.

Conclusion: The choice of an imaging modality to provide a COVID-19 diagnosis is debatable. It depends on several factors that should be carefully considered, such as disease stage, mobility of the patient, and ease of applying infection control procedures. The pros and cons of each imaging modality were highlighted, as part of this review. To control the spread of the infection, precautionary measures such as the use of portable radiographic equipment and the use of personal protective equipment (PPE) must be implemented.

Keywords

COVID-19, radiology, challenges, ultrasound, computed tomography

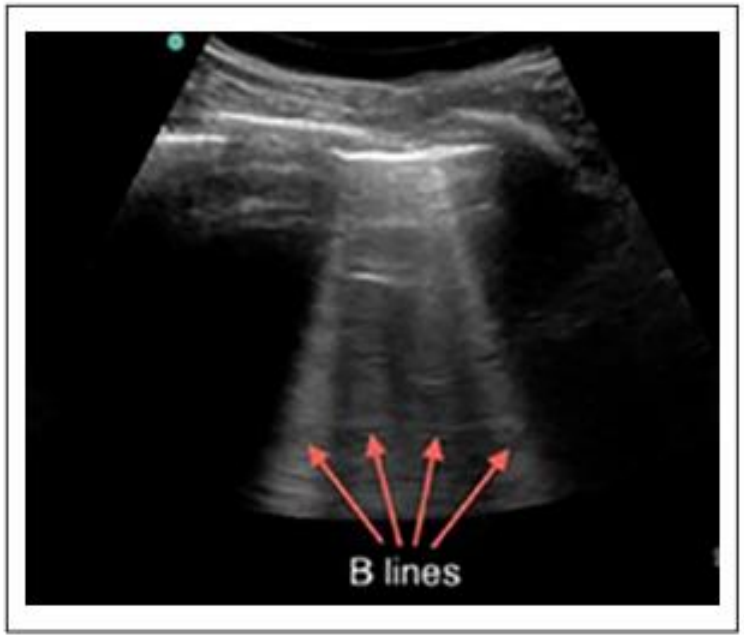

Figure 5. An example lung ultrasound that shows B-lines (vertical artifact).[44]

Figure 6. This lung ultrasound image shows a small consolidation in the anterior area with indistinct margins.[44]

Figure 7. This lung ultrasound shows fixed B-lines, with interrupted pleural line and patchy consolidation.[44]

Lung Sonogram vs. Portable Chest Radiograph

A study was conducted on 11 patients who had a negative COVID-19 based on a nasal swab result. All participants had abnormal sonogram and CXR. Nine out of the 11 patients had typical findings of COVID-19 on a LUS. B-lines were noted on the sonogram, in 8 of the 11 patients. Following these results, all patients had a repeated PCXR and only 6 of the 11 patients had a negative result for the second time with a suspicious LUS. However, the patients were treated and isolated as positive COVID-19 cases.[56]

COVID-19 Performance of a Portable Pocket-Sized Ultrasound System

In comparison to a traditional ultrasound equipment system, portable pocket-sized ultrasound systems are considered inexpensive, flexible, and easy to handle. Therefore, a study was conducted to evaluate the feasibility of using it for COVID-19 diagnosis. There were no significant differences in the scores obtained on a high-end ultrasound equipment system compared to a portable ultrasound unit. The average scores obtained from the 2 equipment systems were normally distributed. There was a good correlation between the 2 equipment systems, regarding the measured parameters.[57]

Conclusion

Although the rRT-PCR test is considered the initial step for diagnosing COVID-19, published studies reported many false negative cases, due to technique related limitation factors. Furthermore, shortage of these test kits in some countries has prompted researchers to look into alternative diagnostic methods, such as clinical imaging. A chest CT can image the lower respiratory tract whereas the rRT-PCR test is limited to the upper respiratory tract. It is also considered the most accurate and sensitive technique for detecting COVID-19, in its early stages. Conversely, LUS can also be used for pregnant patients, enabling safe and multiple serial imaging, without the risk of radiation to patient and fetus. Moreover, UTE-MRI can be used in place of CT to reduce the patient's radiation dose, if serial CTs are required. Precautionary measures included the use of portable X-ray equipment and utilization of PPE, so as to control the spread of all infections.

Ultraschall Med 2021; 42 (06): 652-653
DOI: 10.1055 / a-1248-9068

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Báo cáo trường hợp

Phát hiện siêu âm phổi ở bệnh nhân covid-19 với CT ngực âm tính

Lungenultraschallbefund bei einem Covid-19-Patienten mit negativer Brust-CT

Yale Tung Chen, Milagros Martí de Gracia, Maria Luz Parra Gordo, Silvia Ossaba Velez, Sergio Agudo-Fernández

Vào ngày 11 tháng 3 năm 2020, Tổ chức Y tế Thế giới đã tuyên bố một đại dịch gây ra bởi Hội chứng hô hấp cấp tính nghiêm trọng do Coronavirus 2 (SARS-CoV-2) với sự lây lan đến hơn 180 quốc gia, 18 566 769 trường hợp được xác nhận và 701278 trường hợp tử vong (Johns Hopkins Trung tâm Tài nguyên Coronavirus, được thành lập vào ngày 5 tháng 8 năm 2020).

Health Agencies Update

Autopsies Reveal Lung Damage Patterns From COVID-19

Lung autopsy tissue from 18 patients who died of COVID-19 may provide insight into future treatment of the illness, according to a study in *Science Translational Medicine* led by researchers at federal health agencies.

The results, which include analyses of plasma samples from 6 of the patients, demonstrate how SARS-CoV-2 not only spreads in the lungs and damages them, but also how it affects immune system responses.

The researchers determined that SARS-CoV-2 infected respiratory epithelial cells—which aid in generating and repairing lung tissue—via a different process than influenza. According to the authors, fatal influenza often results from secondary bacterial copathogenesis, unlike fatal COVID-19, which produces pulmonary damage and associated immune responses so severe that coinfection isn't necessary for the disease to become deadly.

Individuals who died more than 20 days following initial COVID-19 symptoms exhibited high levels of pulmonary fibrosis. Furthermore, several individuals had widespread thrombosis, and each had diffuse alveolar damage—a potentially fatal condition that prevents adequate oxygenation of the blood and ultimately stiffens the lungs, according to the study.

All autopsied individuals died between March and July 2020, within 3 to 47 days of symptom onset; they were also diagnosed with at least 1 high-risk factor associated with severe COVID-19. The researchers concluded that their findings may help to predict case severity and recovery among people who are elderly or have obesity or diabetes when they develop COVID-19.

The authors noted that the links they uncovered between disease processes and patients' comorbidities such as diabetes may provide insight into tailoring existing COVID-19 therapeutics based on the stage of the illness.

Suicide Risk Varies With Demographics and Sexual Orientation

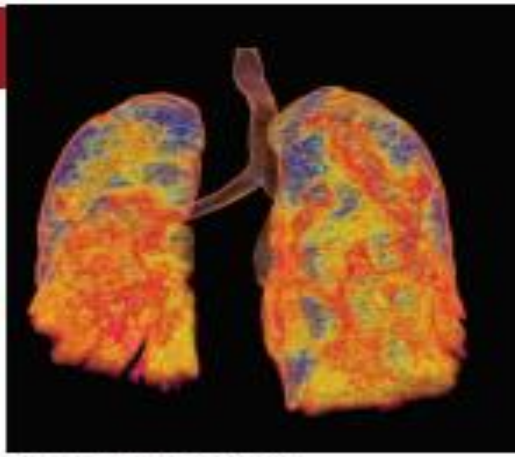
A study led by researchers at the National Institute of Mental Health (NIMH) found that suicide risk among lesbian, gay, and bisexual (LGB) adults varied depending on demographic characteristics, such as the individual's age, gender, or race and ethnicity. The results were published in the *American Journal of Preventive Medicine*.

Previous studies have underscored the heightened risk of suicide among LGB individuals compared with heterosexual individuals. However, according to the study's authors, limited research has assessed how risk differs based on someone's sexual orientation as well as that person's age, gender, or race and ethnicity.

The authors analyzed National Survey of Drug Use and Health data collected from 191 954 US adults—14 693 identified as LGB. Suicidal thoughts, plans, and attempts that occurred within 12 months before the survey were more common among LGB adults than their heterosexual counterparts; when the authors adjusted for demographics, the risk was up to 6 times greater for LGB individuals among all age and race and ethnic groups.

When they accounted for age and race and ethnicity, the authors found that suicide risk among gay men wasn't significantly different than it was among bisexual men. Compared with Black LGB women, White LGB women were more likely to have suicidal thoughts or plans. On a more granular level, both Black and White bisexual women were more likely to have suicidal thoughts than their gay and lesbian peers. Among individuals aged 35 to 64 years, suicidal thoughts were also more common among bisexual women than lesbian or gay women.

"This study demonstrates the importance of asking about sexual identity in national data collection efforts, and it highlights the pressing need for suicide prevention services that address the specific experiences and needs of lesbian, gay, and bisexual adults of different genders, ages, and race and ethnic groups," lead author Rajeev Ramchand, PhD, senior advisor on epidemiology and suicide prevention at the NIMH, said in a statement.



Recent research has shown how SARS-CoV-2 damages the lungs.

K.H. Fung/sciencesource.com

Expanding Localized Outreach to Combat COVID-19

The US Department of Health and Human Services recently announced that it will provide $143.5 million in American Rescue Plan funding to expand local efforts aimed at increasing COVID-19 vaccination. The funding, which comes from the Health Resources and Services Administration (HRSA), will be allocated to 2 programs.

One program will use $66.5 million to assist community-based organizations in circulating information about COVID-19 vaccines in medically vulnerable and underserved communities. Another program will receive $77 million to distribute among 9 other community-based organizations that will customize their vaccination efforts based on local needs.

"These additional investments in community-based funding will help reduce disparities and reach people in underserved communities who have been disproportionately affected by the pandemic," Acting HRSA Administrator Diana Espinosa, MPP, said in a statement.

Such funding is part of HRSA's ongoing goal to increase access and education related to COVID-19 vaccines. In June, HRSA gave $125 million to 14 organizations in an attempt to reach underserved communities in every US state. – **Melissa Suran, PhD, MSJ**

Note: Source references are available through embedded hyperlinks in the article text online.