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Multi-scale Image Analysis and Prediction of Visual Field Defects after Selective Amygdalohippocampectomy

Shagufta Hasan*

Department of Biotechnology, Amity University, Kolkata, India

Corresponding Author*

Shagufta Hasan
Department of Biotechnology, Amity University, Kolkata, India
E-mail: Shagufta.hasan07@gmail.com

Abstract

Patients with therapy-refractory temporal lobe epilepsy benefit from selective amygdalohippocampectomy, however it can induce Visual Field Defects (VFD). We used whole-brain studies from voxel to network level to describe tissue-specific pre- and postoperative imaging correlates of VFD severity. Pre- and postoperative MRI (T1-MPRAGE and Diffusion Tensor Imaging) as well as kinetic perimetry according to the Goldmann standard were performed on 28 individuals with temporal lobe epilepsy. Using voxel-based morphometry and tract-based spatial statistics, we looked for whole-brain Grey Matter (GM) and White Matter (WM) correlations with VFD. We also performed local and global network studies, as well as reconstructing individual structural connectomes. The postsurgical GM volume decreased with increasing VFD severity in two clusters in the bihemispheric middle temporal gyri (FWE-corrected p 0.05). With increasing severity of VFD in the ipsilesional optic radiation, the fractional anisotropy of a single WM cluster decreased (FWE-corrected p 0.05). Furthermore, patients with VFD had a larger number of postoperative local connectivity alterations than those without. We identified no preoperative associations of VFD severity in the GM, WM, or network measures. Nonetheless, an artificial neural network meta-classifier could predict the occurrence of VFD based on presurgical connectomes above the chance level in an exploratory study.

Keywords: Visual Field Defects • Grey Matter •

White Matter

Introduction

The most prevalent focal epilepsy is Temporal Lobe Epilepsy (TLE), which affects 25% to 40% of all epilepsy patients. Approximately 40% of TLE patients are pharmacoresistant, and studies have repeatedly demonstrated the superiority of epilepsy surgery over pharmacotherapy. The anterior temporal lobectomy and selective amygdalohippocampectomy are the two most prevalent surgeries (SAH). While multiple studies have found no difference in the number of patients who become seizure-free after surgery, the potential advantage of sAH is the lesser cognitive loss after surgery due to the preservation of the temporal cortex and underlying white matter. A transsylvian or subtemporal method to SAH can be used. When compared to the transsylvian technique, the subtemporal approach has the advantage of avoiding a partial separation of the temporal stem. To gain access to the mesial temporal regions, a piece of the fusiform gyrus is excised. After sAH, between 60% and 80% of patients are seizure-free.

Visual Field Impairments (VFD) have been reported to develop in 15% to 100% of individuals undergoing temporal lobe resective surgery, preventing the ability to drive a car even in people who are seizure-free permanently. The spatial closeness of the Meyer's Loop (ML) to the resection cavity in the temporal lobe causes these VFD, which commonly manifest as contralateral homonymous upper quadrant anopia, sometimes known as 'pie in the sky.' Patients who underwent sAH via a subtemporal route had a lower risk of postoperative VFD than those who underwent SAH via a transsylvian approach, according to reports. With an estimated 100.000 TLE patients potentially susceptible to epilepsy surgery each year in the United States alone, a better knowledge of how damage occurs and how to prevent it during surgery is critical. However, a multi-modal, data-driven strategy to identifying structural underpinnings of perioperative VFD in many tissue types and scales has yet to be explored. We use numerous whole-brain analyses to look for presurgical Grey Matter (GM) and White Matter (WM) predictors of postoperative VFD using imaging and perimetry data from patients undergoing SAH. Furthermore, we want to look into the direct and indirect impacts of the surgical surgery on both voxel and structural connectome levels, as well as how these relate to VFD. We also want to use a mix of structural connectomics and supervised machine learning methods to predict postoperative VFD in an exploratory study.

Results

Clinical group differences

In the automated Goldmann perimetry, 21 of the 28 patients in the research showed postsurgical VFD, while the other 7 showed no VFD. Age, gender, epilepsy duration, and surgery-scan interval did not differ significantly between VFD and non-VFD patients (all p > 0.05). The demographic variables listed above did not differ between the subtemporal and transsylvian surgery technique groups (p > 0.05). Patients who had sAH with a subtemporal access, on the other hand, had less severe VFDs (p 0.05). In a regression analysis using VFD as the dependent variable, the extent of the postoperative resection and the preoperative Euclidean distance between the temporal pole and the most anterior region of Meyer's loop were shown to be non-significant (both p > 0.45).

VLSM results

In the ipsilesional external capsule and the uncinate fasciculus, VLSM analysis of all 28 manual lesion masks revealed a significant correlation between lesioned voxels and postsurgical VFD severity (FWE-corrected p 0.05; volume = 423 mm^3). The GM of the ipsilesional temporal pole (FWE-corrected p 0.05; volume = 41 mm^3) and the parahippocampal gyrus (FWE-corrected p 0.05; volume = 25 mm^3) both had smaller significant clusters.

VBM results

We discovered a significant decrease in ipsilesional GM volume in our patient cohort using a permutation-based paired t-test comparing pre- and postsurgical T1-weighted scans for the subgroup of patients who underwent a transsylvian surgery operation (n = 18). The largest cluster covered extensive areas of the ipsilesional caudate, putamen, pallidum, and thalamus, as well as other subcortical structures. Aside from subcortical structures, the postsurgical GM reduction cluster also included areas of the insular cortex, as well as the inferior and middle temporal gyrus. A cluster containing the ipsilesional inferior frontal gyrus resulted in the opposite contrast of a postsurgical GM volume increase, although it did not survive FWE-correction (uncorrected p 0.001).

After excluding patients with a surgery-scan gap of more than 12 months, clusters remained significant. In a second analysis, we looked for a linear relationship between the degree of VFD and postsurgical GM volume and found two significant clusters in the posterior divisions of both the ipsi- and contralesional middle temporal gyrus, both of which showed a decrease in GM volume as the degree of VFD increased. For both the transsylvian and subtemporal patient cohorts, this linear relationship may be stated. The presurgical T1 scans were subjected to the opposite contrast as well as the same contrasts, with no notable results.

TBSS results We used a permutation-based paired t-test to compare pre- and postsurgical FA in the transsylvian subgroup, in addition to the VBM analysis. We discovered considerably lower FA-values in vast portions of the ipsilesional temporal and inferior frontal lobe, similar to the GM alterations mentioned above. The inferior and superior longitudinal and fronto-occipital fasciculi, as well as the anterior thalamic radiation and the uncinated fasciculus, were all covered in clusters. In contrast, a large cluster of postsurgically enhanced FA was found in the ipsilesional corona radiata, particularly in the corticospinal tract. This cluster, on the other hand, did not withstand FWE correction (uncorrected p 0.001). After excluding individuals with a surgery-scan interval of more than 12 months, all clusters remained significant. When we looked for a linear link between FA and the severity of VFD, we found a single cluster where FA decreased as the severity of VFD increased. The cluster corresponded to the sagittal stratum's position inside the ipsilesional optic radiation's trajectory, as established by probabilistic tractography. Both the transsylvian and subtemporal patient groups may see the linear relationship. On presurgical DTI scans, the opposite contrast as well as the correlation analysis yielded no significant results.

Differences in connectivity between groups

When comparing pre- and postsurgical mean connectivity matrices, sAH can be seen in the postsurgical connections that have been negated, such as the amygdala and hippocampus. Apart from this clear finding, both the VFD and no VFD patient groups show a modest decrease in the streamline count of connections inside the ipsilesional hemisphere (upper left quadrant of connectivity matrices). The connection matrices alone, however, do not reveal any significant changes between the two patient groups. In patients with no VFD following SAH, a drop in streamline count of four edges containing six nodes inside the ipsilesional hemisphere was identified using permutation-based paired t-tests between pre- and postsurgical scans. Patients with postsurgical VFD, on the other hand, had severe loss of connectivity in 73 edges involving 28 different brain areas. The ipsilesional temporal lobe, subcortical and prefrontal areas, as well as temporo-occipital connections, were all affected. The superior temporal gyrus, superior frontal gyrus, and pericalcarine cortex were also included, as were three brain regions from the contralesional hemisphere. In the opposite contrary, there was no substantial increase in streamline counts. When the sample was divided into surgical procedures, the pre- and postsurgical connectome comparisons revealed a similar pattern of connectivity differences: after subtemporal SAH, a significant decrease in streamline count was seen in 24 strictly ipsilesional edges spanning 15 nodes, primarily involving the temporal lobe and subcortical brain regions. In comparison, after transsylvian SAH, there was a more wide-spread loss of connectivity, with lower streamline counts in 70 predominantly ipsilesional edges involving 29 brain areas, two of which were on the contralesional hemisphere. The polar opposite did not provide any notable outcomes.

Discussion

We went attempted to uncover presurgical correlates of postsurgical VFD in this investigation. While we found numerous postsurgical variations between patients with and without VFD in both grey and white matter structures, we were unable to discover any presurgical changes, either at the voxel or structural network level. Despite the lack of statistical significance, supervised machine learning methods might be used to uncover patterns that appear to discriminate these two patient groups solely based on presurgical structural connectomes with above-chance accuracies. Patients receiving temporal lobe resective surgery have had their imaging analysed on a regular basis. This is the first study to link surgery-related grey and white matter consequences to VFD on a worldwide scale. The structural changes found are largely consistent with the findings of prior studies: following epilepsy surgery, both degeneration and neuroplastic reorganisation can occur, which is mirrored by a loss or increase in grey matter volume or fractional anisotropy. White matter abnormalities linked with VFD can be identified using voxel-based lesion-symptom mapping and correlation studies. It should be noted that these findings could reflect VFD correlations or causative relationships. The distinction between causal relationships and correlates, in particular, can only be made using common knowledge of the anatomy and physiology of the visual system. While the changes in the ML are consistent with prior research and to be expected, the bilateral nature of the VBM-cluster in the posterior division of both the ipsi- and contralesional middle temporal gyri is unexpected. This could be explained by diaschisis/secondary degeneration of so-called homotopic connectivity: diaschisis is defined as the post-lesional alteration of brain regions that are distant from but related to the anatomical site of damage.

The particular interconnectivity of mirror parts of the cerebral hemispheres is referred to as homotopic connectivity. As a result, bihemispheric white matter alterations have previously been discovered as a side effect of temporal lobe surgery. However, global network measures based on structural connectomes did not reflect the putative reconfiguration. Another unexpected finding is that the location and shape of the TBSS-cluster are related to the degree of the VFD. The current work is the first to use an objective, ROI-independent approach to show alterations in the path of optic radiation following SAH. However, why this cluster was discovered in the sagittal stratum rather than in the temporal lobe remains a mystery. The anterior region of the ML has a lot of interindividual anatomical variability, which could be one of the reasons. The anatomical distance between the temporal pole and the medial lemniscus (ML) ranges from 22 mm to 37 mm. As a result of the dataset's size and class imbalance, even the best performing classifier in this study's generalizability cannot be guaranteed, and it should be viewed as merely exploratory research that may point to a future predictive approach that needs to be developed in a larger, more balanced sample and validated on yet another, external dataset.

The Natural History of Basic Progressive Aphasia is called Aphasia

Alessandro Hoffman*

Editorial Office, Journal of Internal Medicine, Belgium

<u>*Corresponding Author*</u>*

Alessandro Hoffman
Editorial Office, Journal of Internal Medicine, Belgium
E-mail: alessmar001@gmail.com

Abstract

Primary Progressive Aphasia (PPA) is split into three archetypal subtypes, each of which is defined by a single aphasia symptom. Although other cognitive, behavioural, and motor domains may become engaged later in their course, little is known about each subtype's progression profile in relation to the other subtypes. 24 patients diagnosed with Semantic Variant (svPPA), 22 with non-fluent variant (nfvPPA), and 18 with Logopenic Variant (lvPPA) were collected and followed up for 1-6 years in this longitudinal retrospective cohort study based on new biomarker-supported diagnostic criteria. The severity of symptoms, scores on cognitive tests and neuropsychiatric inventories, and development into another syndrome were all evaluated. Over time, lvPPA developed broader language issues (PPA-extended) and nfvPPA developed mutism, although semantic impairment remained the primary issue in svPPA. Aside from linguistic issues, svPPA acquired significant behavioural issues, whereas lvPPA showed a higher deterioration in cognition. Motor impairments were more prevalent in the nfvPPA group. Furthermore, 65.6% of individuals met the clinical criteria for another neurodegenerative condition within 5 years of their clinical beginning (PPA-plus). The clinical features of 14 out of 24 (58%) svPPA patients were consistent with behavioural variant frontotemporal dementia, whereas 15/18 (83%) lvPPA patients were consistent with Alzheimer disease dementia. In addition, 12/22 (54%) of the nfvPPA patients advanced to satisfy the diagnostic criteria for corticobasal syndrome and progressive supranuclear palsy. Despite the fact that aphasia is the syndrome's initial and distinguishing feature, our longitudinal findings revealed that PPA is not a language-specific disorder, and that each subtype's course differs significantly in terms of symptom nature and disease duration.

Keywords: Primary Progressive Aphasia • Grey Matter • White Matter

Introduction

Since Marsel Mesulam first described the clinical condition of Primary Progressive Aphasia (PPA) in six patients in 1982, research has concentrated on characterising the clinical symptoms, underlying molecular pathologies, and genetic foundation of PPA. The syndrome is currently split into three variants: semantic, non-fluent/agrammatic and logopenic. On neuroimaging, SvPPA is associated with loss of word and/or object meaning, decreased confrontation naming, and surface dyslexia, as well as anterior temporal atrophy. In the presence of impairment of the left posterior frontal and insular regions, nfvPPA is characterised by effortful speech, limited speech production, and agrammatism.

The third syndromic form, lvPPA, causes difficulty identifying words and repeating them, as well as temporo-parietal atrophy on the left side of the brain. Although prior research indicates that nfvPPA is the most heritable PPA variant (30%-40% with a family history), a more rigorous investigation revealed that a definite autosomal dominant history is uncommon in all PPA subtypes. While svPPA and nfvPPA are linked to the diseases of Frontotemporal Lobar Degeneration (FTLD), lvPPA is linked to the pathologies of Alzheimer's disease.

The existing diagnostic criteria are known to not encompass all PPA patients, with one-third to half of PPA syndromes remaining unclassifiable. As a result, Mesulam and colleagues (2014) coined the term "PPA mixed" to describe individuals who have both comprehension and grammar problems, which is frequently due to the pathology of Alzheimer's disease. Several other research, on the other hand, have found that the undeclared group may have more complex linguistic issues. Another difficult issue for clinicians is that patients who initially met all of the diagnostic criteria for one of the PPA subtypes develop additional symptoms both inside and outside the language domain as the disease progresses. Coined the term "PPA extended" to describe cases that initially meet the core criteria of one PPA subtype but then progress to another PPA subtype's characteristic language symptoms, whereas Rogalski and Mesulam (2009) coined the term "PPA + (plus)" to describe the progression into other neurodegenerative syndromes that accompany the PPA diagnosis. To our knowledge, the patterns of the three PPA subtypes' PPA-extended and PPA-plus forms have never been investigated systematically in a well-categorized PPA cohort. To far, the few longitudinal research on PPA have either been published before the current diagnostic criteria were established in 2011 or have focused on a single subtype or cognitive domain. Two previous longitudinal cohort studies, to our knowledge, have adopted the current categorization and focused on the syndrome's whole illness course. Unfortunately, these studies are difficult to evaluate due to a lack of information about the participants' amyloid status and a lack of specific descriptions of symptomatology. Furthermore, there is a lack of an overall perspective of the development profiles, as well as patterns of PPA-extended and PPA-plus versions of the PPA subtypes.

Methods

Patient selection

Between January 2011 and March 2019, 126 patients who met the current diagnostic criteria for PPA were retrospectively included from the Amsterdam Dementia Cohort. The unclassified individuals (n= 14) were removed from the study since the goal was to show the progression pattern of each subgroup. We also eliminated the cases (n= 5) that had the clinical profile and neuroimaging markers of right temporal variant frontotemporal dementia on closer inspection. This is significant since right temporal variant frontotemporal dementia has been demonstrated not to be a primary language disorder and to have a distinct development pattern than svPPA. It's worth noting that all of the rtvFTD instances that were excluded were right-handed. In addition, cases in which the patient was not a native Dutch speaker (n= 3), had no records of amyloid status (n=1), or had less than a year of clinical follow-up (n= 39) were omitted. CSF amyloid β-42 levels (n = 54) or amyloid PET data (n=32) were available for the remaining individuals. Initial neuroimaging met PPA radiological diagnostic criteria. The final selection resulted in a sample of 64 PPA patients, 24 of whom were diagnosed with svPPA, 22 with nfvPPA, and 18 with lvPPA, according to current diagnostic criteria.

Statistical analysis

SPSS Statistics, version 24.0 (IBM), and R Studio were used to conduct the analyses (R Core Team, 2018).

Chi-square was used to assess differences in categorical variable frequencies between groups (svPPA, nfPPA, and lvPPA), and one-way ANOVA or Kruskal−Wallis analysis was used to compare continuous variables between groups, depending on the distribution of the variables based on the Shapiro−Wilk normality test. The Bonferroni correction was used to correct post hoc comparisons for multiple comparisons. For each individual, Linear Mixed Models (LMM) with a random intercept and slope were used to measure change in cognitive functioning across time. For each diagnostic group, separate models were ran for each cognitive test (dependent) with time (measured on a continuous level) as the independent variable. To determine progression into PPA-plus, nonparametric survival analyses were undertaken using Kaplan−Meier estimates Interquartile Range (IQR) with post hoc Mantel Cox log rank testing. The data was thresholded at a corrected p value of less than 0.05.

Results

In the lvPPA group, the gender distribution was nearly equal. The majority of svPPA subjects, on the other hand, were male, whereas the nfvPPA group was predominantly female. The CDR and IADL scores did not differ across diagnostic groups in terms of age, symptom or follow-up time, or CDR and IADL scores. All svPPA patients tested negative for amyloid, but one (4%) nfvPPA patient and 15 (83%) lvPPA patients tested positive for amyloid. Although a few patients in each group were left-handed, there was no statistical difference in the distribution of handedness (p = 0.86). To determine receptive language dominance in left-handed people, we looked at whether clinical symptoms matched the anatomic distribution of cortical atrophy and clinical presentation. One nfvPPA patient with a hexanucleotide repeat expansion in the chromosome 9 open-reading frame 72 (*C9orf72*) gene had a positive family history for FTD, and two lvPPA patients had a positive family history for AD, whereas none of the svPPA patients had a clear autosomal dominant inheritance of any type of dementia. Pathological confirmation had not been obtained in any of the cases. Apart from the *C9orf72* repeat expansion patient, another nfvPPA patient had a pathogenic mutation in the progranulin gene, missense variant with a modified Goldman score of 2. The most apparent symptoms and comprehensive longitudinal symptom distribution are displayed to determine the distinct clinical profile and progression pattern of each subtype.

The three PPA variations' initial clinical profiles

Language issues were the most common concern in all diagnostic categories, as expected, and because our inclusion criteria were based on the current classification system, the types of deficiencies were consistent with the diagnoses. lvPPA individuals reported more general cognitive impairments such as memory deficits (p 0.01), executive dysfunction (p 0.01), apraxia (p = 0.01), and visuospatial problems (p 0.01). They also performed worse on the FAB and VOSP fragmented letters tests, showing executive and visuospatial impairment, though the difference was not statistically significant. Although memory problems were noted more frequently in lvPPA patients, svPPA patients initially performed worse on verbal memory tests. In nfvPPA, motor symptoms were nearly exclusively observed. At the initial visit, extrapyramidal impairments were found in 27% of nfvPPA participants, which was higher than the other groups (p= 0.02). Pyramidal symptoms were observed in one nfvPPA individual, but not in the svPPA or lvPPA subjects.

Progression to PPA-extended

During the course of the disease, patients developed numerous cognitive and behavioural impairments as well as motor abnormalities, despite the fact that linguistic problems remained prevalent in all subtypes. In terms of language impairments, nfvPPA and lvPPA patients developed various additional language problems over the course of the disease that formally satisfied the diagnostic criteria of another PPA condition, which we refer to as "PPA extended." In svPPA, on the other hand, loss of semantic knowledge remained the primary issue, as evidenced by severe declines in naming and semantic memory tests.

Although the other language issues of svPPA patients, such as repetition problems and diminished spontaneous speech, were not enough to justify using PPA-extended, they did demonstrate a significant decline in letter fluency with time on the letter fluency test. It's worth noting that none of the svPPA subjects developed mutism, and dysarthria was never observed in svPPA. During follow-up, mutism was seen in 8 patients, 7 of whom had nfvPPA. Repetition, as well as single word and phrase comprehension, decreased in nfvPPA participants. Furthermore, over time, four of the nfvPPA patients satisfied the diagnostic criteria for svPPA (PPA-extended). During the course of the disease, however, PPA-extended was the most common in the lvPPA group.

Progression to PPA-plus

Apart from linguistic impairment, all groups experienced overall cognitive decline over time, especially the svPPA and lvPPA. The MMSE declined significantly in the svPPA and lvPPA groups (p = 0.001), but not in the nfvPPA group. At the follow-up visits, lvPPA individuals reported significant memory losses, executive dysfunction, and visuospatial issues, with a larger deterioration on the visual and verbal memory tests (p 0.05), FAB (p 0.001), digit span backward (p=0.01), and VOSP fragmented letters (p=0.14). However, in the second year of the disease course, svPPA individuals showed a considerable deterioration on verbal memory tests, and about half of the svPPA subjects indicated episodic memory deficiencies (issues remembering recent events). It's worth noting that our retrospective design didn't allow us to separate the role of semantic impairment in episodic memory problems. In comparison to other subtypes, nfvPPA demonstrated a relatively mild progression pattern on cognitive tests; however, they developed apraxia during the course of the disease. Furthermore, executive dysfunction became a common symptom for both svPPA and nfvPPA, as well as lvPPA, and all subtypes showed significant declines on the FAB.

Discussion

We explored overlapping and distinguishing clinical characteristics, as well as the progression pattern of the three PPA subtypes, in this retrospective longitudinal cohort study to compare the natural history of the three PPA subtypes. Despite the fact that aphasia is the first and most prevalent symptom of PPA, our findings revealed that it is a complex clinical condition in which additional cognitive, behavioural, and motor impairments evolve with time. Following diagnosis, each subtype followed a predictable pattern of progression (PPA-extended and PPA-plus). Subjects with nfvPPA developed motor impairment and proceeded into various types of neurodegenerative syndromes such as CBS, PSP, and MND, whereas subjects with svPPA experienced motor impairment and progressed into various forms of neurodegenerative syndromes such as CBS, PSP, and MND. In terms of linguistic issues, nfvPPA and lvPPA patients developed symptoms outside the fundamental criteria over time, whereas svPPA patients did not. On deeper inspection, lvPPA dropped on repetition, understanding, and speech production, while nfvPPA declined on comprehension and repetition [13], in keeping with prior longitudinal research. The development of phrase comprehension issues, on the other hand, was the most significant change in svPPA across time, as previously observed. Despite the fact that svPPA patients scored lower on the letter fluency test, as revealed in a recent longitudinal study, they were more fluent than the other subtypes, and svPPA patients did not have mutism/ dysarthria or PPA-extended.

In conclusion, while aphasia is the only and most common symptom of PPA, it does not take long for other symptoms to appear. More critically, it has a subtype-specific progressive pattern. Although svPPA appears to have a more homogeneous language profile, healthcare providers and caregivers should be aware of any behavioural issues that may arise, whereas lvPPA should be expected to have global cognitive decline and broad language problems due to underlying Alzheimer's disease pathology. Patients with nfvPPA may be least impacted in the behavioural and cognitive domains at first, but may proceed to other neurodegenerative diseases, notably those linked with motor impairment, which can be fatal.

Validation and Evaluation of the Use of Emergency Physicians and Neurosurgeons

Elena Hoffman*

Editorial Office, Journal of Internal Medicine, Belgium

Corresponding Author*

Elena Hoffman
Editorial Office, Journal of Internal Medicine, Belgium
E-mail: elena.hoffman@gmail.com

Abstract

The goal of this study was to see if the Canadian CT Head Rule (CCHR) was valid in cases of minor Traumatic Brain Injury (TBI) in an Indian emergency room. The patterns of neuroradiology references between the Emergency Physician (EP) and the neurosurgeon were compared as a secondary goal. Between July 2019 and July 2020, the study was conducted prospectively. Patients who met the inclusion criteria were given CCHR and the results were recorded. For the ultimate decision, the neurosurgeon was consulted. In the event of a disagreement between the neurosurgeon and the EP, the neurosurgeon made the neuro-radiology decision. The CCHR offers 100% sensitivity as a screening tool for individuals who need CT brain scans due to a TBI, while the specificity is low (45.8%). In comparison to neurosurgeons, EPs had a better level of awareness and inclination to use CDRs in situations of minor TBI to guide the decision for neuro-radiology. Residents at the emergency department said they felt safe using the rule through a smartphone application.

Keywords: Visual Field Defects • Grey Matter • White Matter

Introduction

Injury, particularly connected with street auto collisions, is quite possibly the most well-known purposes behind understanding to present to the crisis office. An enormous subset of these patients has awful mind injury of shifting seriousness. The choice to perform mechanized tomography on these patients is something that the ED doctor might confront on numerous occasions during a solitary shift. A CT mind, however painless, is anything but an exceptionally harmless examination. There is critical writing that expounds upon the expected mischief of even a solitary CT mind. The radiation openness from a solitary non contrast CT mind might change from one foundation to another however on a normal the number is taken as 2 milliesieverts (mSv). This can be placed in context with the way that this is identical to the aggregate regular foundation portion that a normal human gets throughout 8 months. The aggregate lifetime hazard of malignant growth from a solitary CT cerebrum is an element old enough as portrayed by Brenner. It differentiates the significance of clinical dynamic guidelines for requesting imaging in instances of TBI, particularly in the pediatric age bunch. One more element that should be considered is the monetary weight of directing a CT cerebrum both from the patient's and the establishments perspective.

A non-contract CT mind costs extremely high which is a huge sum for the majority of the Indian patients. The subject of the significant expense of neuroradiology in the Indian clinical situation has been talked about in ongoing writing. While a moderate technique ends up being a savvy one, the screening measures should be exceptionally touchy in order to guarantee patient wellbeing while at the same time keeping the expense of care at the base. These were the exact derivations drawn. at the point when they detailed that when a profoundly delicate dynamic device like the Canadian CT Head Rule (CCHR) was applied, it prompted critical reduction in the expense of care while guaranteeing patient wellbeing.

The quantity of fatalities because of street auto collisions in India have consistently ascended throughout the course of recent years: from 94,970 of every 2005 to 1,51,420 out of 2018. Horrendous mind wounds (TBIs) structure a critical subset inside this information pool. Gauges recommend that over half of all injury related passings in India have TBI as the major contributory reason. Yet, a more profound survey of writing uncovers a somewhat amusing issue. There is a prominent deficiency of writing zeroing in on TBI in the Indian populace. With this viewpoint, we picked to devise a review around patients giving minor TBI to the ED of a tertiary consideration showing emergency clinic in metropolitan Maharashtra. We chose to concentrate on legitimacy of the utilization of CCHR to the introducing populace, while directing a near investigation of the dynamic cycles selected by ED doctors and the neurosurgeons for exposing the patients to CT imaging.

In patients whose first CT was negative for anomalies, a recurrent CT was acquired if during the ED perception period any of the previously mentioned boundaries showed irregularity for example crumbling in GCS, change in pupillary reaction, seizure movement, tireless spewing or deferred appearance of any indications of basal skull crack. The ED floor specialist incharge of the shift inspected each instance of minor TBI to guarantee the use of the mediation to every quiet. Assuming that a case was missed tentatively in the review, the case records were checked reflectively for use of CCHR. In the event that CCHR was not applied to a member, they were barred from the review test. The CT examines were accounted for by a certified radiologist.

This study is the first in an Indian patient populace to contrast crisis doctors and neurosurgeons concerning the utilization of a clinical choice apparatus with respect to CT use in the setting of minor TBI. There is serious lack of information in regards to street car crashes by and large, and particularly in regards to TBI, emerging from India. Provincial investigations have been tested by the absence of a complete brought together public vault. The National Injury Surveillance Center, laid out by the Ministry of Health and Family Welfare, Government of India is the test case program started toward this path however it is as yet in its beginning stages. Exhaustive information will upgrade the comprehension of injury and work with a normalized way to deal with substances like TBI. The appearance of formal scholastic preparation in Emergency Medicine has cured the circumstance partially yet focuses with qualified ED doctors are as yet uncommon. The normalized preparing system picked ED an inhabitant depends intensely on an algorithmic methodology and on Clinical Dynamic Standards (CDRs). While CDRs are not past blunder and are continually likely to change, dependence upon them establishes a climate of expert obligation, asset productivity and fundamental responsibility, making the course of medical services conveyance patient driven. Non-adherence to CDRs is normal. Indeed, even in that populace, containing EPs, neurosurgeons and radiologists, EPs showed the most significant levels of mindfulness and real use of CDR. An intriguing concentrate out of New York Presbyterian concentrated on the mentalities of doctors towards the utilization of CCHR with the expectation to diminish radiation openness.

The review detailed an incredibly critical ascent (84%) in the clinician information in regards to the utilization of CCHR. However, a similar report additionally announced that 83% of the members were just 'modestly' leaned to utilize it clinically and that also was the point at which it spoke to them and assuming it was ordered by the medical clinic specialists. This prompts the component of obligation that emergency clinics should acknowledge in commanding the utilization of CDRs. Giving medical care in India, particularly crisis care, is a test in view of the horrible proportion between the quantity of patients requiring care and the assets accessible for the arrangement of the said medical services. This turns out to be really applicable in instances of neurotrauma which will generally use critical assets in the ED, both in work force and foundation. An exceptionally appropriate investigation of this issue was finished. from National Institute of Mental Health and Neurosciences (NIMHANS) who tracked down that of all the TBI references that their ED got, roughly half (48%) had ordinary CT filters. Inconsistent references with no premise in any CDR lead to wastage of an exorbitantly restricted asset in any foundation: the CT scanner. The aimless way to deal with getting CT filters by specific doctors may likewise originate from the scholarly preparation climate. In our review a significant distinction between the treating EPs and the neurosurgeons was the degree of mindfulness with respect to the CCHR that the two gatherings showed (EPs being more mindful). A similar measurable distinction was seen in the degree of acknowledgment towards a brought together CDR by the occupants of both the claims to fame: crisis inhabitants being more disposed to utilize CCHR. Consideration of clinical dynamic guidelines in standard clinical educating can build the degree of acknowledgment and solace that a doctor/specialist might show with respect to the use of CDRs in clinical practice. Asset productivity of the CCHR feels somewhat unsure. This turns out to be especially important in the Indian setting, where crisis medication must be polished in a tightfisted way. A similar point is featured in our review where 22.8% of the subjects chose to take release AMA due to the worry for the expense of care. Such high recurrence of release AMA ought to worry in any tolerant populace, particularly one that concerns TBI.

This isn't an issue selective to India as was obviously reflected. who announced that in grown-up injury patients, the uninsured ones were almost certain to pick release AMA. Being uninsured was refered to as a justification for release against doctor guidance in 27% of the cases in their review which associates intimately with our insights in regards to something very similar.

Conclusion

All of the patients were admitted to the emergency room for neuro-monitoring. Seven of the patients (6.9%), all of whom had hemorrhagic lesions identified during the NCCT, gradually worsened and necessitated the placement of an endotracheal tube for airway protection. 16.8% of the participants required neuroprotective treatment with intravenous Mannitol and antiepileptics, while 24.7 percent of the patients needed suturing and scalp closure, Following the mandatory institutional period of neuro-observation, 65 patients were discharged in good neurological condition. Only 12 of the 35 patients who were recommended for admission to the neurosurgical care unit agreed, while 23 (22.8%) chose to be discharged against medical recommendation. The inability to handle the cost of ongoing management was indicated by all 23 as the reason for AMA discharge. One patient died in the emergency room due to non-trauma-related comorbidities. According to the review technique, every one of the included patients (n=101) went through a NCCT cerebrum study, regardless of the symptomatic pathway that the CCHR coordinated. The neurosurgeons were not dazed to the choice of the EPs seeing the CT filter as the EP's choice was archived in the patient's consideration plan. Shows the particular CT examine aftereffects of patients who satisfied at least one of the CCHR models and furthermore the ones who didn't. Out of 62 subjects who were coordinated to the CT mind pathway according to the CCHR models, 46 (74.1%) were accounted for to have ordinary CT filters, while 16 had either hemorrhages (n=12) or wounds (n=4). Every one of the subjects who didn't satisfy any models of the CCHR (n=39), were accounted for to have ordinary CTexamines.

Global Amnesia: Silent Brain Infarction Frequency

Nida Fatima*

Department of Biotechnology IBST, Shri Ramswroop Memorial University, Lucknow, India

Corresponding Author*

Nida Fatima
Department of Biotechnology IBST, Shri Ramswroop Memorial University, Lucknow, India
E-mail: nidafatima91@gmail.com

Abstract

To assess the frequency and pattern of acute DWI lesions outside the hippocampus in patients with Transient Global Amnesia (TGA). Patients who presented with TGA and were hospitalised to our hospital between January 2010 and January 2017 were retrospectively assessed. TGA diagnostic criteria were met by all of the patients. We looked at the imaging and clinical data of all patients who had a high-resolution diffusion-weighted MRI within 72 hours after onset of symptoms. The research comprised a total of 126 cases. One or more acute lesions in the hippocampus CA1-area were present in 53 percent (n=71/126) of the patients. In 11% of the cases (n=14/126), additional acute DWI lesions were discovered in other cortical areas. All of the patients who had DWI lesions outside of the hippocampus had TGA-like neurological symptoms. MRI demonstrates acute ischemic cerebral lesions in a significant proportion of clinical TGA patients. As a result, in individuals with TGA, a cerebral MRI should be conducted to rule out cardiac involvement and detect stroke chameleons.

Keywords: Transient Global Amnesia • Disorder •

Symptoms

Introduction

Transient Global Amnesia (TGA) is a neurological disease characterised by the onset of anterograde amnesia that lasts for less than 24 hours. TGA's pathophysiological causes are yet unknown, but it is not thought to be caused by ischemic stroke. Ischemic stroke, on the other hand, can induce acute transitory amnesia, and distinguishing it from TGA on the basis of clinical presentation alone might be challenging. In the diagnostic workflow, magnetic resonance imaging (MRI) with high-resolution diffusion-weighted imaging (DWI) can provide useful information. As a result, the goal of our investigation was to see how common ischemia lesions outside of CA1 were on high-resolution DWI in individuals with TGA.

Methods

Study Population

Patients who presented with TGA and were hospitalised to our hospital between January 2010 and January 2017 were retrospectively assessed. All patients were found by searching our hospital's digital patient records (SAP Clinical Workstation, SAP, Germany) for in-patients with the ICD-10 diagnosis TGA. We screened for TGA as a suspected diagnosis in the emergency department rather than as a final diagnosis to prevent selection bias. After admission, an MRI was usually done the next morning. As a result, in patients with multiple brain infarcts, the presumed diagnosis was altered from TGA to stroke as the final diagnosis.

In the emergency room, each patient was assessed by a neurologist. TGA was defined by established diagnostic criteria: witnessed attack, anterograde amnesia, no loss of consciousness or personal identity, cognitive impairment limited to amnesia; no other focal neurological symptoms during or after the attack; no epileptic features or active epilepsy; no recent head injury; and symptom resolution within 24 hours. TGA was diagnosed in patients who had clinical TGA with a single or bilateral isolated punctuate DWI lesion in the hippocampus. Ischemic stroke was detected in patients with clinical TGA and additional acute ischemic lesions on DWI. Age, sex, timing of symptom onset, and cardiovascular risk factors were among the demographic and clinical data collected from patients.

Acquisition and analysis of images

A 3 T MR scanner was used for all MRI exams (Magnetom Trio; Siemens AG, Germany, 32-channel head coil). High-resolution DWI, T2*-weighted imaging, MR-angiography, and fluid attenuated inversion recovery were all part of the conventional MRI stroke protocol (FLAIR). Slice thickness 2.5 mm, repetition time TR 8900 ms, echo duration TE 93 ms, slice gap 0, b values 0 and 1000 mm*2/s were the sequence parameters for high-resolution DWI. DWI was evaluated for probable lesions outside the hippocampus level, in addition to the predicted abnormalities in the hippocampal CA1-area. Statistical methods- The percentage of patients with additional ischemia lesions on DWI in all clinically diagnosed TGA patients over the course of the study. We employed the Mann−Whitney U test for continuous variables and the 2 test for categorical variables to compare groups of patients with and without additional ischemic lesions. A P value of 0.05 (two-tailed) was utilised as a statistical significance criterion in all analyses. We utilised the Statistical Package for Social Sciences to analyse the data.

Results

Between January 2010 and January 2017, we found 126 patients with clinically confirmed TGA and 3 T MRI within 72 hours of symptom start, with a mean age of 66 (10) years with 66 (52%) of them being female. We identified and removed 78 patients with clinically confirmed TGA who did not have a 3 T MRI for various reasons in addition to the 126 patients. Table 1 compares demographic and clinical characteristics of TGA patients with and without extra ischemia lesions on DWI, as well as all patients with clinical TGA in whom 3 T MRI was done. One or more acute punctuate DWI lesions were identified in hippocampal CA1-areas in 56 percent (71/126) of all patients. Unilateral hippocampal lesions were seen in 41% of patients (52/126) and bilateral hippocampus lesions were found in 15% of patients (19/126). Patients with additional acute DWI lesions in brain locations other than the hippocampus were found in 11% of cases (14/126). Eight patients had cortical lesions in the anterior circulation, one patient had cortical lesions in the posterior circulation, and two patients had subcortical lesions in the posterior circulation. The anterior and posterior circulations of three patients had cortical DWI abnormalities. Individuals with extra DWI lesions had a considerably greater rate of coronary heart disease (25 percent vs. 6.8%, p = 0.034), whereas arterial hypertension and female sex were not significantly more common in these patients. Age, past stroke frequency, and other cardiovascular risk factors such as atrial fibrillation were not different between the two groups.

Discussion

In this 3 T MRI investigation, nearly 10% of patients with acute amnesia clinically considered to be TGA had acute lesions on high-resolution DWI outside the hippocampus level, in addition to the expected and verified punctuate hippocampal lesions in the CA1-area. A transitory disruption in the hippocampal functional memory network is thought to be the source of acute and transient amnesia in TGA. As a result, a punctuate DWI lesion in the hippocampus area can be identified in many patients clinically presenting with TGA.

Recent data has shown that ischemic amnesia, or transitory amnesia, can be caused by ischemia lesions affecting the hippocampus circuit. In one of these investigations, 1.2% of patients with acute amnesia were later found to have cerebral ischemia, but the exact rate of ischemic amnesia could not be calculated because only 25% of clinical TGA patients had an MRI and information on DWI image resolution was unavailable. Second, because they met all clinical TGA criteria, only two patients with ischemic amnesia were considered certain TGAs before imaging. In our stroke centre, we use 3-Tesla MR imaging to identify stroke events in patients who are clinically presenting with TGA. More crucially, we use a high-resolution DWI with a 2.5-mm slice thickness and no slice gap, which allows us to detect tiny lesions that would otherwise go undetected at lower image resolution. Additional acute lesions were mostly found in the anterior circulation or throughout numerous vascular areas, implying heart (or aortic arch) involvement.

The hippocampus is known as the "forgotten" border zone of brain ischemia, therefore this could be significant. Coronary heart disease and arterial hypertension were more common in patients with additional acute lesions, increasing the risk of acute cardiac dysfunction. Overall, high emotional or physical stress as a frequent triggering event combined with excessive sympathetic activation may cause cardiac diastolic and/or systolic output dysfunction, damaging vulnerable brain areas such as the hippocampus. Furthermore, these patients were considerably more likely to have a history of coronary heart disease. In addition, two patients were found to have Takotsubo syndrome (TTS). TTS, like TGA patients, is an acute but temporary left ventricular cardiac failure with a previous mental or physical stressful event.

Overall, high emotional or physical stress as a frequent triggering event combined with excessive sympathetic activation may cause cardiac diastolic and/or systolic output dysfunction, damaging vulnerable brain areas such as the hippocampus. This probable aetiology of TGA and ischemia amnesia is supported by a newly published study that found that individuals with TGA had a twofold higher risk of cardiac injury than patients with transient ischemic attack. In another recent study, over 9% of TGA patients showed high sensitive troponine T levels, indicating myocardial damage.

This could point to a pathophysiological link between TGA and TTS, bolstering the theory that TGA is linked to acute cardiac dysfunction, which leads to further brain injury. Thus, in individuals clinically presenting with TGA, a cerebral MRI with high-resolution DWI and a cardiovascular workup can help detect additional acute lesions that could be related to cardiac failure or myocardial injury. The retrospective nature of our investigation, as well as the single-center design, increase the possibility of selection bias. Because of contraindications to undergoing MRI or because they were released before 3 T MRI was available, not all patients with clinical TGA had 3 T MRI. In addition, cardiovascular and neuropsychological testing were not done in a systematic manner. The homogeneity of our cohort, with routinely acquired high-resolution DWI in most clinically presenting patients with TGA over a long study period, is one of our strengths.

Conclusion

Acute ischemic lesions in patients who present with TGA are clearly more common than previously considered. As a result, in patients with clinical TGA, a brain MRI should be conducted to look for ischemia lesions that could be associated to cardiac dysfunction or myocardial injury. This study has shown that the plentifulness, region under the bend and activity potential length rose somewhat and the nerve conduction speed changed little at 6% strain and 30s-1 strain rate. This finding, according to the viewpoint of neuroelectrophysiology, made sense of the view that nerve stretch inside as far as possible might be valuable to neurotherapy. With the increment of endlessly strain rate, the adequacy nerve conduction speed and region under the bend of the CNAP kept on diminishing, however activity potential length expanded essentially. The lessening of abundancy implied that the quantity of nerve filaments that could create activity potential was decreased. The increment of activity possible length and the decline of conduction speed showed that the coordinated edginess of nerve strands diminished and the myelin sheath of nerve fiber was peeled. At 18% strain and 50s-1, nerve conduction was totally hindered meaning the deficiency of nerve capability.

Assessment of the Psychosocial Effect of Covid-19 Among Adults in Ebonyi State During the Outbreak of the Pandemic in Nigeria

Nkiru Edith Obande-Ogbuinya[1], Ben N Ohuruogu[2], Lois N. Omaka-Omari[2], Esther I. David[3], Eunice N. Afoke[2], Patricia C Ngwakwe[2], Emeka U. Mong[2], Uzochukwu C. Ibe[4], Theresa N. Nnaji[5], Chijioke Stanly Anyigor-Ogah[6], Imah Henry Ikechukwu[7], Christian O. Aleke[2]*

[1]Science Education, Faculty of Education, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State Nigeria.
[2]Department of Human Kinetics and Health Education, Ebonyi State University, PMB 053 Abakaliki, Ebonyi State, Nigeria.
[3]Department of Home Economics, Hospitality Management and Tourism, Ebonyi State University, Nigeria
[4]Department of Anatomic Pathology, Alex-Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria
[5]Paediatrics Department, Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria
[6]Department Of Family Medicine, Alex Ekwueme University Teaching Hospital, Abakaliki, Nigeria
[7]Department of Science Education (Physical and Health Education), University of Delta State, Nigeria

*Corresponding Author**

Christian Okechukwu Aleke
Department of Human Kinetics and Health Education, Ebonyi State University, PMB 053 Abakaliki, Ebonyi State, Nigeria
E-mail: christian.aleke@yahoo.com

Abstract

The COVID-19 pandemic with its unique measures to attenuate the spread has created a public hysteria especially among the adult. This study aimed at assessing the psychosocial effect during the outbreak of Covid-19 among the elderly in Ebonyi state. The descriptive cross-sectional survey was employed. A snowballing sampling technique was used in the study due to lockdown and movement restriction at the time of the study. An online semi-structured questionnaire was developed using Google forms. The link of the questionnaire was sent through emails, WhatsApp and other social media platform for people to fill. 81 adults between 18 years and above participated. This comprised 41(50.6%) males and 40(49.4%) females. Data collected were analyzed using percentages while, ANOVA and T-tests were used to test the null hypotheses at .05 significant levels. Results indicated that 50% of adult 18 years-24 years had anxiety, 50% had distress, 66.6% had insomnia and 25% had depression. Also adult between 25 years-44 years, 66.7% had anxiety, 31.3% had distress, 62.5% had insomnia and 14.6% had depression. While more psychosocial effects were reported among 45 years-64 years with 72% having anxiety, 36% with distress, 66.6% with insomnia and 16% with depression. By gender, the females had more psychological effects than the males. As greater number of women 72.5% indicated anxiety, 30% indicated distress, 45% show insomnia and 22.5% indicated depression whereas 61% men shows anxiety, 34.1% shows distress, 34.1% indicated insomnia and 9.8% shows depression. The result of the null hypothesis tested indicated age difference with (p=0.006) and gender (P<0.035) in psychosocial effects of COVID-19. The study concluded that an intervention programme such as psychosocial health care services among adult population in Ebonyi state is required against future epidemic.

Keywords: Psychosocial effects • COVID-19 • Adult population • Ebonyi state

Introduction

In December 2019, multiple cases of viral pneumonia like, which related to the South China Seafood Market, was reported in Wuhan, Hubei Province of China. Those cases were later known to be caused by a novel corona virus (2019-nCoV) [1]. The World Health Organization (WHO) later in January, 2020, declared the outbreak of the novel virus COVID-19 with a public health emergency desiring international intervention [2]. The WHO further disclosed that there is a high risk of COVID-19 spreading to other countries around the world. This prompted WHO in 11th March 2020, to declare COVID-19 a pandemic due to its global significant morbidity and mortality rate [3]. The COVID-19 pandemic which is causing untold fear and suffering especially among the older people across the world with both physical and social reasons; firstly, the older people in particular do not have as strong an immune system hence they are more vulnerable to infectious disease. Again they're also more likely to have conditions such as heart disease, lung disease, diabetes or kidney disease, which weaken their body's ability to fight the novel virus [4].

The United Nation has noted that the fatality rate is more on the older people. UN further observed that as at 26 April 2020, the virus itself has already taken the lives of some 193,710 people, and fatality rates for those over 80 years of age is five times the global average [5]. "Although all age groups are at risk of contracting COVID-19, older persons are at a significantly higher risk of mortality and severe disease due to the infection". "An estimated 66% of people aged 70 and over have at least one underlying condition, placing them at increased risk of severe impact from COVID-19" [6]. Older persons may also face age discrimination in decisions on medical care, triage, and life-saving therapies. World Health Organisation (WHO) has observed that as the coronavirus pandemic rapidly sweeps across the world, it is inducing a considerable degree of fear, worry, and concern in the population at large among certain groups in particular, such as older adults, care providers and people with underlying health conditions [7]. Age wise, older people have been reported to be more vulnerable to COVID-19 and its consequential effects. For such people to know and be told that they are vulnerable can be extremely scary and much fear-inducing.

Global inequalities mean that, already pre-COVID-19, as many as half of older persons in some developing countries including Nigeria did not have access to essential health services [8]. The Experts have cited this from the onset of COVID-19 and worried about the novel virus spreading to Africa, due to obvious inadequacies of the healthcare systems in the continent, having problems such as lack of equipment, lack of funding, insufficient training of healthcare workers, and inefficient data transmission. Melinda and Bill Gates observed that COVID-19 spreading to African countries would be horrible as millions of dead bodies would be littered on the streets [9, 10]. The UN further observed that as the virus spreads rapidly to developing countries including Nigeria, the mortality rate for older persons could climb even higher as a result of fragile health and social protection systems [6].The situation in Nigeria was worrisome with the arrival of the index case convened by an Italian business man on February 28, 2020. This Italian who was confirmed as Nigeria's first coronavirus case and the first in sub-Saharan Africa after arriving from Milan, Northern Italy was in Nigeria for almost two full days, traveling through Lagos and visiting another state before being isolated (Akwagyiram 2020). Lagos, with about 20 million people, is the biggest city in Nigeria, Africa's most populous country with a population of over 200 million people. The identification of the COVID-19 index case in the country actually created panic among the individuals both the old and the young including the authorities in the country that the virus could spread quickly due to the Nigerian weak health systems and the government ineptitude in handling emergencies of this nature [11]. This uncertainty and fast spreading of the novel virus had been causing universal worry, anxiety and distress, all of which according to WHO are natural psychosocial responses to the randomly changing condition [12]. Adverse psychosomatic outcomes among common people especially the adult population is nevertheless expected to increase significantly due to the pandemic itself and also due to constant flow of readily available information and reinforced messaging obtained from internet-based social websites or social network sites such as Face book, WhatsApp, Instagram, Twitter, Pinterest, LinkedIn, YouTube among others that serve as instrument for interaction between person to person, or group of persons. The consequences of this infomedics, misinformation,

misconception, conspiracy theory about COVID-19 pandemic in the country are rapidly expanding mass hysteria and panic regarding COVID-19. This online infodemics can hamper an effective public health response and create confusion and distrust among people and would trigger an enduring psychological problem which may be more detrimental in the long run than the virus itself [13, 14]. The psychological feelings associated with COVID-19 pandemic may vary from panic behaviour or collective hysteria to pervasive feelings of hopelessness and desperation which may associate with negative outcomes including suicidal behavior [15, 16]. Other health measures may also be compromised by abnormally elevated anxiety [17]. As the society became increasingly exposed to anxiety-provoking topics, fear, depression, insomnia and distress related to the outbreak of COVID-19.

A study conducted by Hasan and Kazmi to explore the impact of COVID-19 and lockdown on mental health of individuals found significant difference among depression, anxiety and stress across age, gender and employment [18]. Depression was found to be high among the respondents of age range 15 years to 35 years. Anxiety was found to be prevalent among those between 21 years and 25 years of age. Stress was found to be high in individuals of 21 years -25 years of age. On gender, greater number of women (39%) when compared with men (31%) worried more about COVID-19 infection. About 31% of the women worried that they will not be able to afford testing or treatment of corona virus if the need arises. The same study also showed that women were more likely to worry about the consequences of coronavirus except with regards to investments [19]. Another study found that women were more likely to show worse feeling than men in corona virus fallout [20]. While domestic violence; a psychosocial health problem can affect men or women. However, women experience it more. In the United States of America, women are two more times likely to suffer violence from their partners and 14 times likely to be harassed sexually or raped within the lockdown period. Another study assessed rates of mental health outcomes in Italian general population three to four weeks into lockdown measures and explores the impact of COVID-19 related potential risk factors. Being a woman and younger age were associated with PTSS, depression, anxiety, insomnia, high perceived stress and adjustment disorder. Quarantine was associated with PTSS, anxiety and ADS [19]. The psychosocial effects on adults can differ by age and gender respectively. According to a study by Haozheng, Baoren and Quan, in Hubei, China, found that medical staff within the age of 31 and 40 was more worried about infecting their families compared with other groups. Also staffs who were over 50 years were more stressed on seeing their patients' die due worry about their safety and lack of protective device including exhaustion due to increased workload [21].

Prior studies have revealed that mental well-being had been heavily affected by this kind of global pandemic [22, 23]. The level of loneliness, depression, harmful alcohol and drug use, and self-harm or suicidal behaviour which is not unconnected to the measures adopted by the government in the containment of the novel virus (COVID-19) especially quarantine and lockdown and its effects across society, presents a range of particular risks especially for older persons [6,7]. The social activities that have been restricted in most countries including Nigeria, where almost all not essential individual movements were prohibited due to lockdown and quarantine, while the local hospitals received suddenly thousands of critically ill COVID-19 patients and were forced to implement their emergency protocols [24]. In this situation, the general population as well as the older adult became vulnerable to the emotional impact of COVID-19 infection due to both the pandemic and its consequences worldwide [25, 26]. Many psychological problems and important consequences in terms of mental health including stress, anxiety, depression, frustration, uncertainty during COVID-19 outbreak emerged progressively [26]. As the society became increasingly exposed to anxiety-provoking topics, infomedics and misinformation among others related to the outbreak of COVID-19 which has created panic, fear, depression, insomnia, anxiety and distress among the people. It is imperative to investigate the psychosocial effect of COVID-19 among selected adult in Nigeria. To determine the various possible ways in which COVID-19 pandemic outbreak and its containment measures affect psychosocial aspect of the adult population in Nigeria.

Adult population of Nigeria in the context of this paper refers to those from 18 years upward with matured minds (mental and physical maturity) who know about the current health crisis in the country and what it may portend at the end of the day. The psychosocial effects seem to manifest in these adult's daily basis as precautionary measures which was imposed

in order to attenuate the COVID-19 spread in Nigeria continues without enough attention to the social and psychological impacts of the mental health of Nigerians adult population [27]. Given to the reviewed literature, most of the studies on the psychological impact of COVID-19 were mostly done outside the shores of this country. Different writers expressed their perceptions of the psychosocial effects. Nonetheless, none specifically sought to practically determine the psychosocial effects on the adult populace that seem to be bearing the brunt of it all. Also, from the reviewed literature, it could be seen that there is dearth of literature in determining level of knowledge on mechanisms of coping with the psychosocial effects of COVID-19 and not necessarily the psychosocial effect of COVID-19 among adult in Nigeria. It is in the light of this gap that the present study aimed to investigate the psychosocial effect of COVID-19 among selected adult in Nigeria. The variables such as age and gender have not been explored in recent studies however these in the main formed the basis for the present study to determine the psychosocial effects of COVID-19 among the selected adults in Nigeria based on age and gender.

Materials and Methods

The descriptive online survey research design was employed in the study. This design was found applicable to describe the psychosocial effect of COVID-19 among adult in Ebonyi state. The population of the study comprised 81 adults who were purposefully used because they responded to the Google instrument within the time limit purposely set for the study. A snowballing sampling technique was used in this study due to the present lockdown and movement restriction which made it very difficult to physically access people at the time of data collection. An online semi-structured questionnaire was developed by using Google forms, accompanied with consent letter. The link of the questionnaire was sent through emails, WhatsApp and other social media to people on the contact of the investigators. The prospective respondents were then encouraged to roll out the survey to as many of their colleagues as possible. Thus, the link was forwarded to people apart from the first point of contact. Eighty-one (81) Nigerian adults aged between 18 years and above participated in the study. The participants comprised 41 males and 40 females.

A total of 25 questions were administered which comprised two sections namely; Socio-demographic variables and psychosocial effects of COVID-19 among the adults. The completed instrument was automatically recorded by the Google and thus used for data analysis. The analysis was done using SPPS version 20. Frequencies and percentages were used to answer the research questions while Pearson Chi square, ANOVA and t-test statistic were used to test the hypotheses at 0.05 level of significance. The results were represented using tables and figures.

Results

Data in (Table 1) shows that out of 81 respondents that participated in the study, 9.9% are between ages 18-24. 59.3% are between ages 25-44 and 30.9% are between ages 45-64. The table further shows that 50.6% of the respondents are males while 49.4% are females adult. The findings in Table 2 indicated that the 50% of adult between the age brackets 18 years-24 years had anxiety, 50% had distress, 66.6% had insomnia and 25% had depression. 66.7% of adult between the age brackets 25 years-44 years had anxiety, 31.3% had distress, 62.5% had insomnia and 14.6% had depression. Also 72% adult between the age bracket 45 years -64years had anxiety, 36% had distress, 66.6% had insomnia and 16% had depression. The (Table 2) further showed that 50% of the age bracket 18-24 had no anxiety, 50% had no distress, 33.4% had no insomnia and 75% had no depression. Also, 33.3% of those in the ages 25 years-44years had no anxiety, 68.7% had no distress, 37.5% had no insomnia and 85.4% had no depression. Also 28% of those between the ages 45 years-64years had no anxiety, 64% had no distress, 33.4 had no insomnia while 84% had no depression. Data in (Table 3) shows that 72.5% of female adult indicated having anxiety, 30% indicated distress, 45% show insomnia and 22.5% indicated depression while 61% male adult shows anxiety, 34.1% shows distress, 34.1% indicated insomnia and 9.8% shows depression. However, 27.5% of female had no anxiety, 70% had no distress, 55% had no insomnia and 77.5% had no depression also 39% of male had no anxiety, 65.8% had no distress, 65.8% had no insomnia and 90.2% had no depression (Figure 1, 2).

The Null Hypotheses

Ho1: There will be no significant difference in psychosocial effects of

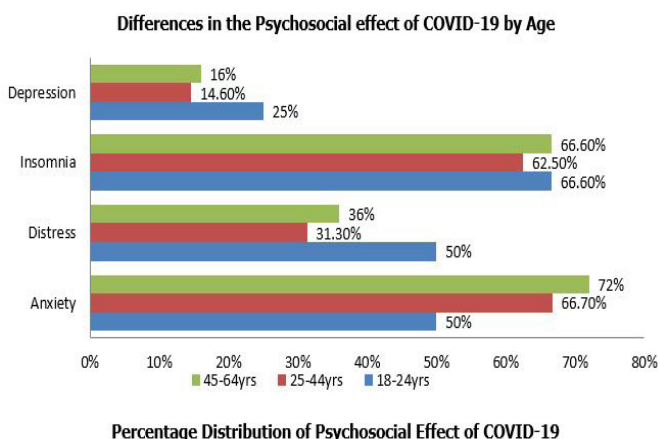**Table 1.** The Socio-demographic characteristics of the study participants.

Variables	Frequency (81), n (%)
Age-group (Years) (*n*=81)	
18-24	8 (9.9%)
25-44	48 (59.3%)
45-64	25 (30.9%)
Gender (*n*=81)	
Male	41(50.6%)
Female	40(49.4%)

**Table 2.** Frequency and percentage distribution of psychosocial effects of COVID-19 by age.

Variables	18-24 years	25-44years	45-64 years
Age-group	8(9.9%)	48(59.3%)	25(30.9%)
(Years)(*n*=81)			
Anxiety			
Yes			
No	4(50.0)	32(66.7)	18(72.0)
	4(50.0)	16(33.3)	7(28.0)
Distress			
Yes	4(50.0)	15(31.3)	9(36.0)
No	4(50.0)	33(68.7)	16(64.0)
Insomnia			
Yes	5(66.6)	30(62.5)	17(66.6)
No	3(33.4%)	18(37.5%)	8(33.4)
Depression			
Yes	2(25.0)	7(14.6)	4(16.0).
No	6(75.0)	41(85.4)	21(84.0)

Table 3. Frequency and percentage distribution of psychosocial effects of COVID-19 by gender.

Variables (Gender) (n=81)	Female 40(49.4%)	Male 41(50.6%)
Anxiety		
Yes	29(72.5)	25(61.0)
No	11(27.5)	16(39.0)
Distress		
Yes	12(30.0)	14(34.1)
No	28(70.0)	27(65.8)
Insomnia		
Yes	18(45)	14(34.1)
No	22(55)	27(65.8)
Depression		
Yes	9(22.5)	4(9.8)
No	31(77.5)	37(90.2)

Differences in the Psychosocial effect of COVID-19 by Age

Percentage Distribution of Psychosocial Effect of COVID-19

Figure 1. Percentage distribution of psychosocial effects of COVID-19 among selected adults in Nigeria by age
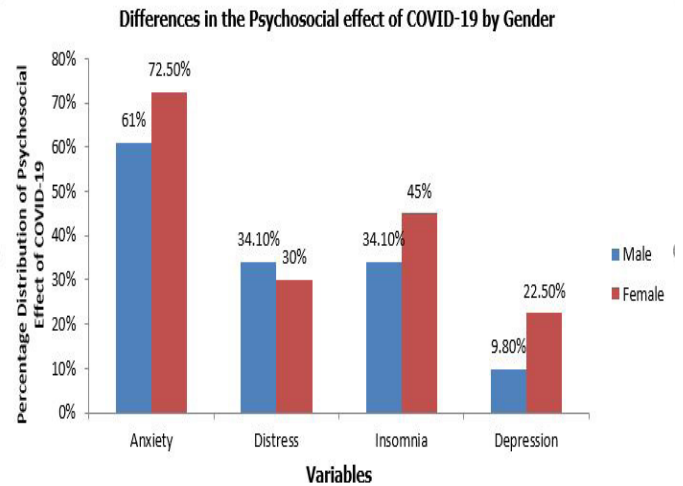
Figure 2. Percentage distribution of psychosocial effects of COVID-19 among selected adults in Nigeria by gender

Table 4. Summary of ANOVA on Psychosocial Effects on COVID-19 by Age

Source of Variance	Sum of square	Df	Mean	F-value	P-value	Decision
Between Groups	10.608	3	3.536	4.436	0.006	Significant
Within Groups	62.173	78	0.797			
Total	72.78	81				

Table 5. Summary of independent sample test of psychosocial effects on COVID-19 by gender.

Levene's Test for Equality of Variance t-test for Equality of Means							
Error	F	Sig.	t	df	Sig (2 tailed)	Mean Difference	Standard Difference
Equal variance assumed	0.19	0.7	2.141	79	0.035	0.418	0.195
Equal variance not assumed			2.141	78.28	0.035	0.418	0.195

COVID-19 with its precautionary measure by age.

Data in (Table 4) show a statistically significance between groups as determined by one-way ANOVA (F=4.436, p=0.006). A Turkey post hoc test was used to conduct the test at α=0.05. Hence, the null hypothesis is rejected.

Ho2: There will be no significant difference in the psychosocial effects of COVID-19 with its precautionary measure by gender

From data in (Table 5) Levene's test for equality of variance, the null hypothesis tested on psychosocial effects on COVID-19 by gender is rejected hence there is significant difference in psychosocial effects of COVID-19 by gender. With equal variances assumed, the t-statistic value is 2.141, the degrees of freedom (df) is 79 and the significance value of the test (p-value) is 0.035 less than 0.05 level of significance.

Discussion

The present study conducted an assessment of psychosocial effect of COVID-19 among selected adult population in Ebonyi state. As the disease progressed, concerns regarding health, and livelihood of adult population increased day-to-day as they are the worse hit by the novel virus. Studies have reported that COVID-19 pandemic is causing untold fear and suffering especially among the older people across the world with both physical and social reasons, that the older people in particular do not have as strong an immune system hence they are more vulnerable to COVID-19 pandemic. Also they are more likely to have conditions such as heart disease, lung disease, diabetes or kidney disease, which weaken their body's ability to fight the novel virus [4].

There are psychosocial health concerns of the adult population such as anxiety, distress, worries, insomnia and depression especially after the declaration of lockdown in Nigeria on 30th March, 2020 as people were encouraged to maintain social distancing, regular hand washing and use of sanitizers, use of face mask in public and good reparatory hygiene in Nigeria [28]. As number of cases surged, other control measures were applied such as the lockdown of the three most affected states and closing the Nigerian borders [29]. Again as some other states across the country reported the outbreak various degrees of lockdown were also carried out.

This lockdown directive involved the closing down of all schools, both primary, secondary, tertiary institutions and government parastatals, also bans on religious and social gatherings involving more than 20 persons, restrictions on businesses activities among others [28]. Further declared that there should not be any social gathering of any kind and due to this instruction, there were many cancellations of social events like burial, wedding, birthday, naming, congregational prayers, convocation ceremony. In order to ensure complete compliance on the directives both federal and state governments constituted taskforces to ensure that people in their respective states do not default. All these measures to attenuate the spread of novel COVID-19 in the country actually triggered emotionally challenges, anxiety, worry, distress, insomnia and depression especially among the adult as they were restricted from movement. World Health Organization has urged to take the necessary precautions to tackle the negative impact of the spread of Coronavirus on psychological health and well-being [30].

The findings of the current study indicated that the 50% of adult between the age brackets 18 years-24 years had anxiety, 50% had distress, 66.6% had insomnia and 25% had depression. 66.7% of adult between the age brackets 25 years -44 years had anxiety, 31.3% had distress, 62.5% had insomnia and 14.6% had depression. The present study was in consonance with the study conducted by Hasan and Kazmi to explore the impact of COVID-19 and lockdown on mental health of individuals which found significant depression, anxiety and distress across age, gender and employment. Depression was found to be high among the respondents of age range 15 years to 35 years. Anxiety was found to be prevalent among those between 21 years and 25 years of age. Distress was found to be high in individuals of 21 years-25 years of age. The reason may not be far-fetched given to the youthfulness of the age groups. They are within the explorative age of their life enjoying every bit of it that any calamity be it sickness or environmental disaster instills much fear of the unknown and other neurotic behaviours in them [18]. The study also found that 72% of adult between the age bracket 45 years -64 years and above had anxiety, 66.6% had insomnia. These results agree with the previous studies, who reported uncertainty of the health situation among the elderly such as stress, anxiety, and depression related COVID-19 symptoms [31, 32]. These results highlight the great negative psychological impact that the COVID-19 pandemic is having on the adult population. These also could signal future development of negative psychological outcomes that are common in the aftermath of crises and disasters, such as posttraumatic stress disorder, generalized anxiety or major depression disorders, and substance abuse [33, 34]. The study also found that 36% of adult between the age bracket 45 years-64 years and above had distress, 16% had depression. The finding is not surprising and thus expected as some literature in the field of disaster indicates that the elderly are particularly vulnerable to the negative psychological sequelae of critical situations [35]. The findings is also in line with the studies who found that age constitutes a protective effect that in older disaster victims usually show lower stress, anxiety, and depression symptoms than younger participants, and this trend may be explained by their greater life experience, previous disaster exposure or by having to face fewer life responsibilities [36]. On gender, greater number of women 72.5% indicated having anxiety, 30% indicated distress, 45% show insomnia and 22.5% indicated depression when compared with men 61% shows anxiety, 34.1% shows distress, 34.1% indicated insomnia and 9.8% shows depression about COVID-19 infection. The study agrees with those of Rodríguez-Rey, Garrido-Hernansaiz, Collado whose study demographic variables showcase that males had lesser psychological impact of COVID-19 outbreak as compared to their female counterpart as the impact on females was found to be statistically significant [36].

These findings were also similar with the study carried out in the Chinese community where females suffered a greater psychological impact due to the coronavirus outbreak [37]. Another study also found that women were more likely to show worse feeling than men in corona virus fallout [20]. The present study is also in consonance with the previously available extensive epidemiological literature which shows that women are at a higher risk [38, 39]. It is also in line with other studies carried out in China about the COVID-19 pandemic which show that women and young adults were the ones that suffered the greater psychological impact [40].The findings are not unconnected to the fact that women are usually the informal caregivers within families, so the necessary restrictive measures, such as schools and childcare facilities closures, increase women majority of health-care workforce, therefore being more likely to be infected by the coronavirus [41]. It should also be noted that higher rates of domestic violence against women are usually registered during this time of lockdown which constitutes another source of distress [42, 43].

The result of the null hypothesis tested indicated age difference in psychosocial effects of COVID-19 (F=4.436, p=0.006). The study is in accord with the study of Hasan and Kazmi which found significant difference among depression, anxiety and stress across age [18]. It is also inconsonance with the study who indicated that the psychosocial effects on adults can differ by age [21].The null hypothesis tested on psychosocial effects on COVID-19 by gender is rejected hence there is significant difference in psychosocial effects of COVID-19 by gender. With equal variances assumed, the t-statistic value is 2.141, the degrees of freedom (df) is 79 and the significance value of the test (p-value) is 0.035 less than 0.05 level of significance. The result is in the same as Hasan and Kazmi study which also found significant difference among depression, anxiety and stress across gender [18].

Conclusion

Based on the results of the study, all the age groups had psychosocial effects of anxiety, distress insomnia and depression. There is significant difference in psychosocial effects of COVID-19 on adult population by age (p<.006) and there is significant difference in psychosocial effects of COVID-19 by gender (P<0.035). In recognition of these findings, it calls for urgent intervention by the Government at all levels, NCDC, Ministries of health and health Policy Makers in addressing issues surrounding adult mental health. The findings of this study could assist health officials, government and the public to provide mental health interventions and coping strategies to the adult population. This can guide researchers to plan prospective longitudinal studies for assessing treatment need as well as finding cure for the novel virus. Besides COVID-19, the 21st century is also the era of emerging pandemic of mental illnesses Thus, psychological and social preparedness of this pandemic carries global importance. The government and stakeholders must appreciate the psychosocial morbidities of this pandemic and assess the burden, fatalities and associated consequences and embark on an effective intervention programme such as.

- The Government at all levels should put in place online health sensitization on the various psychosocial effects alongside their coping mechanisms. This can be done without restrictions for all adults across all age and gender.

- Mental health doctors shall work in collaboration with other frontline workers to offer mental health services to adults in need.

Limitation of study

A key limitation of this study is that future studies should assess the psychosocial effect COVID-19 pandemic in a larger sample of adult population in Nigeria hence the present study does not involve larger numbers of Nigerians to ascertain the generalizability of the current findings. Also studies should be carried out to determine whether younger and older participants recover differently from the psychosocial sequelae of the COVID- 19 crisis.

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