Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Dementia case finding method using Community based Health workers in Rural Areas of Central India

[1]Prakash B Behere, [2]Amit B Nagdive, [3]Aniruddh P Behere, [4]Richa Yadav, [5]Debolina Chowdhury, [6]Quazi Syed Zahiruddin, [7]Rouchelle Fernandes

[1]Former Vice Chancellor, D Y Patil University, Kolhapur (MS); Director Professor,Department of Psychiatry Jawaharlal Nehru Medical College, Director, School ofAdvanced Studies, DattaMeghe Institute of Medical Sciences (Deemed University), Sawangi, Wardha-442107,(Maharashtra) India.
[2]Associate Professor, Department of Psychiatry, Jawaharlal Nehru Medical CollegeDattaMeghe Institute of Medical Sciences (Deemed University), Wardha – 442107, Maharashtra.
[3]Helen Devos Children's Hospital ,Assistant Professor, Department of Pediatrics and Human Development, Michigan State University College of Human Medicine Grand Rapids MI USA, Adjunct Faculty,DattaMeghe Institute of Medical Sciences (Deemed University),Wardha-442107(India)
[4] Assistant Professor , Department of Psychiatry and Behavioural Sciences, OU College of Medicine ,Oklahoma City , Oklahoma, USA Adjunct Faculty ,DattaMeghe Institute of Medical Sciences (Deemed University), , Wardha
[5]Resident, Department of Psychiatry, Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences, Wardha–442107, Maharashtra.
[6]Director (R&D),Associate Dean (Global Health),Professor (Community Medicine), Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences ,Wardha – 442107, Maharashtra.
[7]Resident, Department of Psychiatry, Jawaharlal Nehru Medical College, Wardha –442107, Maharashtra.

Email: [1]pbbehere@gmail.com, [2]amitnagdive77@gmail.com, [3]aniruddhbehere@gmail.com, [4]drrichayadav@gmail.com, [5]debolinac@gmail.com,[6]zahirquazi@gmail.com, [7]rouchelle795@gmail.com

Abstract : This was a **WHO**sponsored project, with the aims to develop, implement and assess the practicability of a novel method of dementia case-finding for India. 1) Estimating the sensitivity (Proportion of true dementia cases correctly Identified) of the community case-finding procedure. 2) Estimating the false positive rate (Proportion of dementia non-cases incorrectly nominated as suffering from dementia) of the community case-finding procedure.3) Estimating the positive predictive value (proportion of nominated cases who do indeed have dementia) of the community case-finding procedure. Anganwadi workers (**A.W**.) were given training to screen dementia patients in community. Out of 8 Talukas in the Wardha District, the Deoli district was selected for the survey.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

The Deolitaluka has 97 villages of which 92 are inhabited villages and a total population of 9895 persons.We screened 83 (85.56%) villages covering 8408(84.98%) population in a time period of 18 months. Total persons above 65 years of age were 5901. The Abbreviated New Castle Scale (**ANCS)** was used for screening (score of 8 or less out of 10 suggests impairment). One Hundred Twenty Four (2.10%) patients fulfilled the criteria and were included in the study. In 21 villages not a single patient of Dementia was found. Potential cases identified by A.W. were 181. The positive predictive value **68.5%,** thetotal Number of subjects above 65 years were 5901 **(6.05%).** Actual patients of dementia in the total population were **124 (0.14 %).** Actual patients of dementia amongst persons aged above 65yrs were **124 (2.10%).**

We were able to identify 124 patients suffering from dementia. One eighty one older persons of suspected dementias was nominated by the **A.W**. which was 1 and a half times of the actual number of dementia cases. Results suggest that the positive predictive value of the community health workers' informal screening was **68.5%.**

Keywords: Dementia, Case Finding, Health Workers, Training, Rural Community

INTRODUCTION

With the proportion of ageingpopulation increasing rapidly all over the world in the 1990s,the focus of interest has gradually shifted towards dementia in low and middle-income countries (LMIC) which had received scant interest earlier from researchers and clinicians alike. More thantwo-thirds of all dementia cases and also,people aged 65 years and older reside in LMIC, and this proportion was predicted to rise exponentially.(1)

A study comparing prevalence rates of dementia among Indian rural populations(2)suggested an age-specific prevalence rate of dementia which was lowerwhen compared to that reported in developed countries. The Alzheimer's Disease International (ADI) suggested that 24·2 million people suffer from dementia worldwide, and rate of new cases was 4·6 million every year(one new case every 7 seconds).(3)

Most studies point towards a lower prevalence of dementia in less-developed regions like sub-Saharan Africa and South Asian regions,in comparison to the developed countries. At the same time, the studies suggested that most people suffering from dementia lived in LMIC: approx. 60% in 2001 and predicted to rise upto 71% by 2040. Figuresare predicted to double every 20 years to more than 80 million people by 2040, with developing regions accounting for a much higher share than the developed regions. Many newer studies have been published, but dementia in LMIC remains neglected.(3-5)

India ranks second among the most populated countries in the world and India is home to about 76 million people aged 60 years or more. This numberis expected to rise exponentiallydue to fast-paced demographic ageing.(6)India has significantly reduced its fertility rates and the overall life expectancy at all ages has also improved which has led to an increased elderly population in India.Projections estimate an approximate increased up to 179 million in 2031 and 301 million in 2051 which will increase the current elderly population

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

from 7.1% to 12-17 % .(7) Projection also expects that of the elderly population which consists of persons aged 60 or more, individualsof the oldest-old group (80 years and above) will grow at the fastest rate and those 70 years and above or the old-old group will increase at a faster rate than that of 60 years. (7) Undeniably health problems in the elderly population will prominently become personal and public health concerns of one of the major public health challenges in India will be the chronic degenerative brain syndrome ,Dementia.
In India, estimates have suggested that the number of people affected by dementia is in excess of 3.7 million approx.(8)It is also estimated that the prevalence of dementiawas 1.9% in India and South Asia in those belonging to age group 60 years and above, with an annual incidence of 4.3/1000. The rate of rise in number of cases was also predicted to be 3-4 times higher in developing countries as compared to developed countries.(3)

The magnitude of healthand social problems posed by Dementiacan no longer be ignored. Despite this substantial challenge, major problems like grossignorance, neglect and paucity of services for people with dementia and their families are rampant in India. Due to advances in medical sciences, the knowledge that dementia is not a part of aging process, but is caused by a variety of diseases, has provided us with a wide array of options for treatment of symptoms associated with dementia and offer much better quality of life to those affected.(5)

There is a lack of epidemiological studies in persons above 65 years having dementia in rural population in India.There islack of good quality epidemiological research in low and middle income countries where more than two-thirds of the world's population with dementia reside.Very few studies have attempted to study the impact of dementia upon the individual, the family and the society, associated disability, dependency, caregiver and economical burden. The health services and systems have also not focused on this aspect.Making an assessment of the exact burden of dementia is important for development of dementia services in the LMICs.(9)

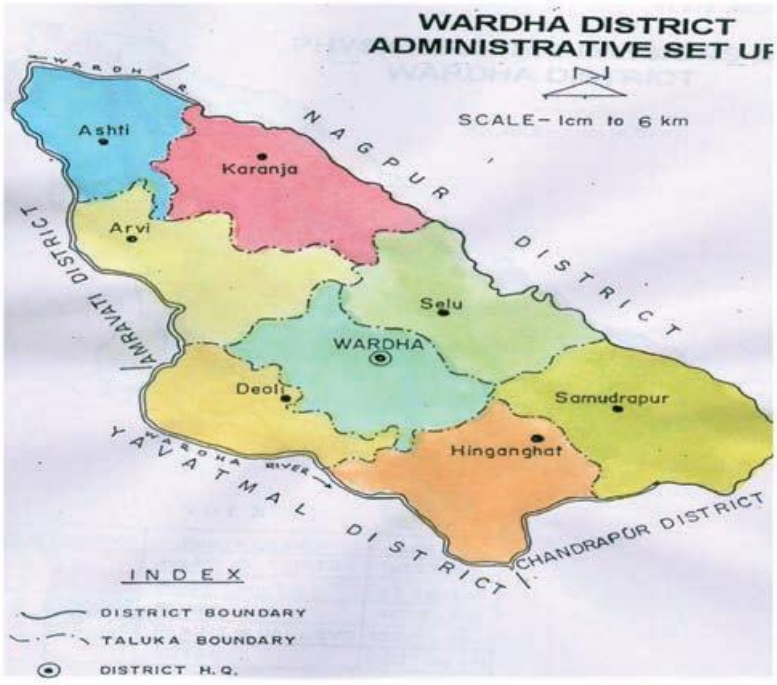
Approximately 10 to 37% of the elderly population suffering from dementia in LMIC countries are categorised as having difficult living conditions requiring long-term and specialised care.(10)The following study was done to develop, implement and assess the practicability of a novel method of dementia case-finding for India. Another study by Vijay Chandra et al(11) found the incidence rates per 1000 person-years for AD to be 3.24.

MATERIAL & METHODS:

Study Setting:

Wardha district has 8 blocks has a population of1,300,774 (2011 census), Wardha district. Wardha district has two Medical Colleges, 07 Rural Hospitals / Sub-District/Divisional Hospitals (SDHs), 27 Primary Health Centers (PHCs).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.



This study was conducted in the Deolitaluka of Wardha District (Wardha District has 8 tehsil) under Maharashtra State. Deoli was chosen, as the catchment area, for the study which comes under Wardha District in Maharashtra State (having 35 districts).

There are 97 villages in Deoli of Wardha District with the population of 98951. Out of 97 villages 5 villages were declared as Rith villages (Empty villages). Thus there were 92 inhabitant villages. We surveyed 83 villages covering 84097 persons, out of which 5901persons were above 65 years of age.

DETAILED ASSESSMENT PROTOCOL:

We have identified all cases of dementia in the Deoli of Wardha district in which the case finding procedure has been applied, by independently conducting a cross-sectional whole population survey using a one stage dementia diagnosis assessment previously validated.

1. Study design

In the centre, catchment area of Deoli was covered by the door-knocking. All co-residents of older subjects were also identified. In the absence of reliable records the age tables linked to local and national historical events were used to validate the participants self-report.

Data Collection Tools: Interviews and measures

Research assistants with a social science or psychology background were responsible for all assessments and supervised by the investigators.

Following instruments were administered

1. House Hold Questionnaire

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

2. Geriatric mental state package (GMS)
3. Cognitive Test (CSI-D)
4. Physical & Neurological Examination – Measures of disablement
5. Socio demographic & risk factor questionnaire

a. Participant version
b. Informant version

6. Informant Questionnaire – Measures care arrangements and theimpact of providing care on caregivers.

INCLUSION CRITERION:

- Rural population of Deoli of Wardha district was included in the study.
- Age group: 65< yrs.
- Both sexes were included.
- Only those individuals were included who fulfilled the Abbreviated New Castle Scale (ANCS) criterion for the dementia were used. (i.e. score 8 ≤ was included in the study)

EXCLUSION CRITERION:

- Population outside the catchment's area of the villages
- Any visitor is the village came from outside catchment areas for short period of stay (<1 year).
- 65> years of age.
- Emergence of psychiatric symptoms before reaching the age of 65 years.
- Those who does not fulfil the ANCS criteria of dementia.
- Associated chronic mental health conditions like delirium.
-

TRAINING:

- Research workers and Data entry operator were sent for training toa Dementia Research Centre in Kochi, Kerala (India) for the training of various instruments and case identification method.
- Training of the research workers also included one week computer operating skills. Field visit were practiced as a part of training.

Training to AW/BWS:

Anganwadi Workers (AW) were given training to identify cases of dementia. In the few villages where there were no AW available, BalWadiShikshika (BWS) were trained instead.
Investigators & field staff were given training for identifying Dementia in the community. The handouts were given in local language (Marathi) to the trainees for reference.
There are 97 villages in Deoli, of Wardha District with the population of 98951. Out of 97 villages 5 villages were declared as Rith villages (Empty villages) and 92 inhabited villages. We surveyed 83 villages covering 84097 persons by June 2004 Total persons above 65 yrs. of age were 5901. The Abbreviated New Castle Scale (ANCS) was used for screening (score of 8 or less out of 10 suggests impairment). One Hundred Twenty Four (2.10%) patients

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

fulfilled the criteria and were included in the study. In 21 villages not a single patient of Dementia was found.

Total population of Deoli Block	**:**	**98951**
Total population covered	:	**84097 (84.98%)**
Total Villages of Deoli Block	:	**97**
Villages have inhabitants	:	**92**
Empty villages (Due to flood area etc.)	:	**5**
Total Villages Screened	:	**83 (85.56%)**
Potential cases identified by A.W. was The positive predictive value		**181 68.5%**
Total Number of subject >65 yrs.	:	**5901 (6.05%)**
Actual patients of dementia as per screening criteria* in the total population	:	**124 (0.14 %)**
Actual patients of dementia as per screening criteria* amongst 65yrs <	**:**	**124 (2.10%)**

We were able to identify 124 patients suffering from dementia. One eighty one older persons of suspected dementias was nominated by the key informants that was 1 and a half time of the actual dementia. Thissuggests positive predictive value of the community health workers informal screening to be around 68.5%.
The screening schedule*: Abbreviated Newcastle Scale (ANCS) was used.

Abbreviated Newcastle Scale (ANCS)

Options	Score	
Age (Nearest year)	0	**1**
Time (Nearest hours)	0	**1**
Address for recall (to be asked at the end of the test)	0	**1**
Year	0	**1**
Name of school	0	**1**
Recognition of persons	0	**1**
Date of Birth	0	**1**
Year of IInd World War Or India's Independence	0	**1**
Name of the Prime Minister	0	**1**

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Count backward from 20 to 1	0	**1**
Total Score		**10**

If the Abbreviated Newcastle Scale score is 8 or less out of 10 then it suggests impairment. Such patients were only selected in the study.

RESULTS

Table 1: Screening of dementia by Abbreviated Newcastle Scale (ANCS)

ANCS	Sex		Total
	Male No. (%)	Female No. (%)	
≤ 8 positive response	50 (0.84%)	74 (1.25%)	**124 (2.10%)**
> 8 positive response	2973(50.38%)	2804(47.51%)	**5777 (97.89%)**
Total	3023	2878	5901

The table 1 shows that 50 (0.84%) male & 74 (1.25%) female had given less than 8 positive responses amongst the total population of 5901 interviewed, hence taken for the study as demented patients, where as 2973 (50.38%) male & 2804 (47.51%) female had given more than 8 responses and hence were not included in the study.

Table 2: Morbidity among dementia participants

	0	1	2	3
Arthritis	**57**	**21**	**31**	**15**
Eye Sight problem	**37**	**23**	**52**	**12**
Hearing difficulty	**56**	**23**	**27**	**18**
Persistent cough	**95**	**11**	**10**	**8**
Asthma	**102**	**11**	**8**	**3**
High blood pressure	**98**	**9**	**17**	**0**
Heart problem / angina	**111**	**7**	**6**	**0**
Stomach / intestine problem	**92**	**10**	**16**	**6**
Faints / blackouts	**81**	**7**	**26**	**10**
Paralysis	**105**	**9**	**6**	**4**

0 = Does not have that Health Problem, 1 = has problem, interferes not at all, 2= has problem, interferes a little, 3= has problem, interferes a lot

In table 2 amongst 124 demented patients, 57 patients had no health problem related to Arthritis or rheumatism, 21 patients had some problem related to Arthritis rheumatism

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

(interferes not at all), 31 patients had problem related to Arthritis or rheumatism (interferes a little) and 15 patients had a lot problem related to Arthritis or rheumatism.

There were 37 patients had no issues with their eyesight, 23 patients had some issues with eyesight, 52 patients had problem related to eyesight which interferes a little and 12 patients had a of lot problems related to eyesight.

Fifty six patients had no health problem related to hearing difficulty or deafness, 23 patients had some problem related hearing difficulty or deafness interferes not at all, 27 patients had problem related to hearing difficulty or deafness interferes a little and 18 patients had a lot problem related to hearing difficulty or deafness.

There were 95 patients who had no health problem related to Persistent Cough, 11 patients had some problem related to Persistent Cough interferes not at all, 10patients had problem related to Persistent Cough interferes a little and 8 patient had a lot problem related to Persistent Cough.

102 patients had no health problem related toAsthma, 11 patients had some problem related to Asthma interferes not at all, 8 patients had problem related to Asthma interferes a little and 3 patients had a lot problem related to Asthma.

Ninety eight patients had no health problem related to hypertension, 17 patients had problem related toBlood Pressure (BP) interferes a little.

One hundred and eleven patients had no health problem related to Heart trouble, 7 patients had some problem related to Heart trouble (interferes not at all) and 6 patients had problem related to Heart trouble (interferes a little).

Ninety two patients had no health problem related to stomach or intestine, 10 patients had some problem related to stomach or intestine interferes not at all, 16 patients had problem related to stomach or intestine (interferes a little) and 6 patients had a lot problem related to stomach or intestine.

Eighty one patients had no health problem related to faints or blackout, 7 patients had some problems related to faints or blackout (interferes not at all), 26 patients had problem related to faints or blackout (interferes a little) and 10 patients had a lot problem related to faints or blackout.
One hundred and five patients had no health problem related to paralysis, 9 patients had some problems related to paralysis (interferes not at all), 6 patients had problem related to paralysis (interferes a little) and 4 patients had a lot problem related to Paralysis.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Table 3: Disability analysis

	None	Mild Difficulty	Moderate Difficulty	Severe Difficulty	Extreme Difficulty
Overall health rating	**5**	**46**	**54**	**11**	**8**
Standing for long periods	**22**	**32**	**26**	**22**	**22**
Difficulty to taking care of household responsibility	**26**	**32**	**17**	**18**	**31**
Difficulty in learning new task	**26**	**29**	**17**	**18**	**34**
Problem in joining in community activity	**34**	**29**	**18**	**18**	**25**
Health problem	**30**	**52**	**21**	**10**	**11**
Difficulty in concentrating for 10 minutes	**26**	**29**	**22**	**18**	**29**
Difficulty in walking in long distance	**22**	**31**	**22**	**20**	**29**
Difficulty in washing your whole body	**68**	**16**	**15**	**12**	**13**
Difficulty in getting rest	**68**	**19**	**13**	**10**	**14**
Difficulty in dealing with people	**64**	**22**	**16**	**11**	**11**
Difficulty in maintaining a friendship	**73**	**15**	**18**	**10**	**8**

In the study there were 124 patients of dementia. Eight (6.45%) patients had very bad overall health rate, & 5 (4.3%) patients had very good overall health rate.

Twenty Two (17.74%) patients had extreme difficulty in standing for long period, 22 (17.74%) patients had severe difficulty in standing for long period, and 22 (17.74%) patients had no difficulty in standing for long period.

Thirty One (25%) patients had extreme difficulty in taking care of household responsibility, 18 (14.52%) patients had severe difficulty in taking care of household responsibility, and 26 (16.94%) patients had no difficulty in taking care of household responsibility.

Thirty four (27.42%) patients had extreme difficulty in learning a new task, 18 (14.52%) patients had severe difficulty in learning a new task, and 26 (26.94%) patients had no difficulty in learning a new task.

Twenty Five (23.4%) patients had extreme problem joining in community activity, 18 (14.52%) patients had severe problem joining in community activity, and 34 (27.42%) patients had no problem joining in community activity.

Eleven (8.88%) patients were extremely affected with heath problem, 10 (8.06%) patients were severely affected with heath problem, while 30 (24.19%) patients were not affected with any heath problem.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Twenty Nine (23.4%) patients had extreme difficulty in concentrating for ten minutes, 18 (14.51%) patients had severe difficulty in concentrating for ten minutes, and 26 (20.97%) patients had no difficulty in concentrating for ten minutes.
Twenty Nine (23.39%) patients had extreme difficulty in walking long distance, 20 (16.13%) patients had severe difficulty in walking long distance, while 22 (17.74%) patients had no difficulty in walking long distance.
Thirteen (10.48%) patients had extreme difficulty in washing their whole body, 12 (9.68%) patients had severe difficulty in washing their whole body, while 68 (54.84%) patients had no difficulty in washing their whole body.
Fourteen (11.29%) patients had extreme difficulty in getting dressed, 10 (8.06%) patients had severe difficulty in getting dressed, and 68 (54.84%) patients had no difficulty in getting dressed.
Eleven (8.88%) patients had extreme difficulty in dealing with people, 11 (8.88%) patients had severe difficulty in dealing with people,while 64 (51.61%) patients had no difficulty in dealing with people.
Eight (6.45%) patients had extreme difficulty in maintaining a friendship, 10 (8.06%) patients had severe difficulty in maintaining a friendship, and 73 (58.87%) patients had no difficulty in maintaining a friendship

Table 4: Cognitive Test among dementia participants

	ADDRESS	Freq	Percent
Address	Abnormal	76	**61.29%**
	Normal	48	**38.70%**
	Total	124	**100%**
Long Memory	Incorrect	116	**93.54%**
	Correct	8	**6.45%**
	Total	124	**100%**
Recall[i]	0 –2	64	**51.61 %**
	3-5	55	**44.35%**
	6 – 8	5	**4.03%**
	9 – 10	0	**0%**
	Total	124	**100%**
Physical & Neurological Examination[ii] **Learning – Fist – Palm – Side**	0	64	**51.6%**
	1	46	**37.1%**
	2	6	**4.8%**
	3	8	**6.5%**
	Total	124	**100.0%**
Physical & Neurological Examination[iii] **Sequencing – Fist –**	0	40	**32.3%**
	1	55	**44.4%**
	2	19	**15.3%**
	3	10	**8.1%**

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Palm – Side	**Total**	**124**	100.0%
Sequencing – reciprocal coordination[iv]	0	63	**50.8%**
	1	47	**37.9%**
	2	6	**4.8%**
	3	8	**6.5%**
	Total	**124**	100.0%
Sequencing – reciprocal coordination[v]	0	53	**42.7%**
	1	50	**40.3%**
	2	13	**10.5%**
	3	8	**6.5%**
	Total	124	100.0%

[i]0 -2= Butter – Arm, 3-5 = letter – Queen – Ticket, 6 – 8 = Grass – Corner – Stone, 9 – 10 = Book – Stick
[ii]0 = requires only one demonstration, 1 = requires 2-3 demonstration, 2 = requires 4 – 5 demonstration, 3 = Unable to learn correctly within 5 demonstration
[iii]0 = 5 sequences correct, 1 = 5 sequences performed with one mistake, 2 = 5 sequences after one re-demonstration, 3 = Unable to complete 5 sequences correctly
[iv]0= requires only one demonstration, 1 = requires 2-3 demonstration, 2 = requires 4 – 5 demonstration, 3 = Unable to learn correctly within 5 demonstration
[v] = 5 sequences correct, 1 = 5 sequences performed with one mistake, 2 = 5 sequences after one re-demonstration, 3 = Unable to complete 5 sequences correctly

48 patients gave correct address but only 8 patients gave a correct response with regard to questions related to long term memory. Amongst 124 demented patients, 64 patients belonged to 0 – 2 recall group, 55 patients to 3-5 recall group, 5 patients to 6 – 8 recall group. Amongst 124 demented patients, 64 patients required only one demonstration, 46 patients required 2 – 3 demonstrations 6 patients required 4 – 5 demonstrations, of fist-palm-side test.Amongst 124 demented patients. 40 patients had 5 sequences correct, 55 patients were have 5 sequences with one mistake, 19 patients were have 5 sequences after one re-demonstration, of fist-palm-side test.Amongst 124 demented patients, 63 patients were required only one demonstration, 47 patients were required 2 – 3 demonstrations, and 6 patients were required 4 – 5 demonstrations, of reciprocal co-ordination.Amongst 124 demented patients, 53 patients had 5 sequences correct, 50 patients performed 5 sequences with one mistake, 13 patients completed 5 sequences after one re-demonstration, of reciprocal co-ordination.

Table 5: Gait among Dementia participants

	0	**1**	**2**	**8**	**9**
Incapable	65	38	15	1	5
Evidence of paralysis	112	4	3	1	4

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Physical abnormality	88	21	10	1	4

0 = Normal, 1 = Mild to Moderate, 2 = Severe, 8 = Inappropriate Answer, 9 = Inapplicable Question

Amongst 124 demented patients, 65 (51.61%) patients had no abnormality of walking, 38 (30.6%) patients had mild to moderate abnormality of walking, 15 (12.1%) patient had severe abnormality of walking, and 1 (0.8%) patent was giving inappropriate answer whereas 5 (4.0%) patients were inapplicable for this question.
112 (90.3%) patients had no evidence of paralysis, 4 (3.2%) patients had mild to moderate evidence of paralysis or stroke, 3 (2.4%) patients had severe evidence of paralysis, and 1 (0.8%) patient was giving inappropriate answer whereas 4 patients were inapplicable for this question.
88 (71.0%) patients had no physical abnormality, 21 (14.9%) patients had mild to moderate physical abnormality, 10 (8.1%) patients had severe physical abnormality of legs like arthritis, amputation, or gross swelling, 1 (0.8%) patent was giving inappropriate answer where as 4 (3.2%) patients were inapplicable for this question.

DISCUSSION:

The development of informant based screening methods for dementia is an emerging filed for research (12, 13). A diagnosis of dementia requires a history of cognitive decline & ensuing social or occupational impairment. The caregiver can provide most of this information. In our study the caregivers were mostly women. The female AW, who enjoys a good rapport with the caregivers, can be useful key informants in that,they meet frequently with women in this area of work,with regular home visits especially during pregnancy & following child birth.During these visits the AW also see older residents; paying respects to the elderly & enquiring about their health is customary when visiting an Indian household. They also maintain the register of persons above 65 years of age in their village.

Our study demonstrates that with training, female community health workers are able to identify a significant number of cases of dementia in the community.
The positive predictive value (PPV) for this method of screening was 68.5% this is much higher than the PPV of various first stage screening methods used in the pilot prevalence studies of dementia in developing countries population (10/66 DRG 2000). In one of the study by Shaji et al the PPV was 64.7%. (14)

Dementia diagnosis is complicated in older population characterised by little formal education & high levels of illiteracy & innumeracy. The cognitive tests that are used to screen for dementia in developed countries lose their ability to discriminate accurately between those with and without the disease.

Prevalence:

In our study we found prevalence of dementia above 65 years person was 2.10%. The prevalence of dementia in total population of 84097 was 0.14%.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

An Indian study conducted by Shaji et al in 1996(15)reported the prevalence of dementia in elderly persons above 60 years was 3.19% in Kerala (South India). The population covered was above 60 years and that may be a reason of slightly higher prevalence.

Vas et al (2001) (16)studied prevalence of dementia in persons aged 65 years and above, among urban Indian population and found it to be 2.44%. This prevalence in urban population was slightly higher than prevalence found in our study which was 2.10% in rural population.

Chandra et al (1998)(2) reported prevalence of dementia in rural Indian community for persons aged 65 years and above as 1.07%. This was the study in Alzheimer's disease. Chandra et al (1998)(2) in his further study reported 1.36% as combined prevalence of Alzheimer's disease and Vascular Dementia in population aged 65 years and above.

Prevalence of dementia World over (17) was 1.4% (65-69 years), 2.8% (70-74), 5.6% (75-79), 11.1% (80-84) and 23.6% (85+).

Two Stage Procedures

Due to the high illiteracy and innumeracy rates in developing countries, a subset with cognitive impairment may incorrectly screen positive for dementia. (2,18). Adaptations according to various cultural circumstances have been made (18) or new instruments have been devised (19) to help avoid this inaccuracies by excluding arithmetical, reading or writing skill tests among others.

Hence cognitive test screening instruments were used to exclude the majority of non-cases, thus defining a smaller group with a high probability of dementia cases for more detailed assessmentAnother noteworthy development has been the development of technique for screening suitably qualified informants from which information can be assessedin case of decline in the subject's functional ability (20,21).

However these screening instruments have a high negative predictive value (NPV) & are thus useful for accurate estimation of prevalence of dementia. We cannot yet report the NPV, sensitivity & specificity of our case identification methods, as only those nominated by the AWS were assessed by the psychiatrist. It is possible that our method is less sensitive & might selectively exclude mild cases.

The PPV of our method might be improved further by intensifying the training on the differentiation between syndrome & functional mental illness. However, one might equally argue that these 'false positive' might also be worth identifying given their likely high levels of unit need.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

The study was carried out in the Department of Psychiatry, in a Rural Medical College in, District Wardha of Maharashtra State.

There are 97 villages in Deoli, of Wardha District with the population of 98951 were covered. We surveyed 83 villages covering a total population of 84097persons. Total persons above 65 years of age were 5901. The Abbreviated New Castle Scale was used for screening (score is 8 or less out of 10 suggests impairment). 124 (2.10%) patients fulfilled the criteria and were included in the study. In 21 villages not a single patient of Dementia was found. In all, 9 villages could not be covered due to monsoon & 5 villages were declared Rith (Empty Villages).

Rural population of Deoli () of Wardha district aged more than 65 years of age of both sexes was screened. Only those individuals who fulfilled the Abbreviated New Castle scale (ANCS) criterion for the dementia were included in the study.

Following were excluded from the study

- Population outside the catchment's area of Deoli.
- Population <65 years of age
- Emergence of psychiatric symptoms before reaching the age of 65 years.
- Those who did not fulfil the ANCS criteria of dementia.
- Associated chronic mental health conditions like delirium.

50 males& 74 females had given less than 8 positive responses amongst the total population of 5901 interviewed, hence taken for the study as demented patients, where as 2973 male & 2804 female had given more than 8 responses and hence were not included in the study.

Out of 124 patients, 38 (30.6%) patients were found in 65-70 years age group, 23 (18.5%) patients were found in 71-76 years age group, 34 (27.4%) patients were found in 77-82 years age group, 17 (13.7%) patients were found in 83-88 years age group and 12 (9.7%) patients were found in more than 89 years.

SUMMARY & CONCLUSION

There are 97 villages in Deoli, of Wardha District with the population of 98951 persons. Out of 97 villages 5 villages were declared as Rith villages (Empty villages). Thus there were 92 inhabitant villages. We surveyed 83 villages covering 84097 populations by June 2004 Total persons above 65 yrs. of age were 5901. The Abbreviated New Castle Scale (ANCS) was used for screening (score of 8 or less out of 10 suggests impairment). One Hundred Twenty Four (2.10%) patients fulfilled the criteria and were included in the study. In 21 villages not a single patient of Dementia was found.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

Total population of Deoli Block	**98951**
Total population covered	84097 (84.98%)
Total Villages of Deoli Block	**97**
Villages have inhabitants	92
Empty villages (Due to flood area etc.)	5
Total Villages Screened	83 (85.56%)
Potential cases identified by A.W. was **The positive predictive value**	181 68.5%
Total Number of subject >65 yrs.	**5901** (6.05%)
Actual patients of dementia as per screening criteria* in the total population	124 (0.14 %)
Actual patients of dementia as per screening criteria* amongst 65yrs <	124 (2.10%)

We were able to identify 124 patients suffering from dementia. Thus prevalence came to 2.10% of above 65 years population and 0.14% in general population. One eighty one older persons of suspected dementias was nominated by the key informants that was 1 and a half time of the actual dementia. This indicates that the positive predictive value of the community health workers informal screening was 68.5%. There were 74 (59.6%) females and 50 (40.3%) males. Majority of the patients i.e. 30.6% were in age group of 65-70 years.

Associated physical problem

25.74% had cardiovascular system abnormalities, 29.02% patients had history of blackouts and 8.06% patients had paralysis. 15.33% of the sample size was rated to have bad health with 16.94% having moderate to severe health problems. Significant number of persons had difficulty in taking care of house hold responsibility, in learning new task or had difficulty in concentrating with 61.29% patients having altered cognitive function. 39.52% had difficulty in walking long distance, 19.35% had difficulty in getting dressed, 27.1% had mild to moderate memory difficulty and 50.8% had difficulty in remembering names of family members.

Symptoms

32.2% patients were found to have mild to severe depression. 32% had mild to severe parkinsonian movements and 25.7% patients had mild to severe abnormality in walking.5.6% mild to severe paralysis and 23% had mild to severe physical abnormality.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 3828- 3844
Received 15 December 2020; Accepted 05 January 2021.

DECLARATION

Scientific Responsibility Statement The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement:

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: The project was funded by International Health Division Ministry of Health and Family Welfare, Govt. of India through W.H.O.

CONFLICT OF INTEREST

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

Informed consent: Informed consent was compulsorily obtained from all individual participants before inclusion in the study.

Ethical approval for study protocol /study design /Methodology:

The study was granted approval by the Medical Ethics Committee of Institute of Medical Sciences, Wardha, and Maharashtra, India.

Contribution: This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

ACKNOWLEDGEMENT: We are thankful to WHO for providing funding to conduct this community work. We are further thankful to Dr. K.S. Shaji, Professor, Department of Psychiatry, Medical College, Thrissur, Kerala, India of 10/66 group for providing training to our research staff.

We are thankful to Anganwadi Workers (AW) and BalwadiShikshika (BWS) of DeoliTaluka of Wardha District who took part in training and identification of Dementia cases in the Community. Theyare keeping the register very meticulously of persons above 65 years of age. Similarly the Sarpanch (Village Head) was very cooperative with our field trial.

REFERENCES:

[1]. Rodriguez L, Ferri C, Acosta D, Guerra M, Huang Y, Jacob K, et al. Prevalence of dementia in Latin America, India, and China: a population-based cross-sectional survey. Lancet. 2008;372(9637):464–74.

[2]. Chandra V, Ganguli M, Pandav R, Johnston J, Belle S, DeKosky ST. Prevalence of Alzheimer's disease and other dementias in rural India: the Indo-US study. Neurology. 1998 Oct;51(4):1000-8.

[3]. Ferri CP, Prince M, Brayne C, Brodaty H, Fratiglioni L, Ganguli M, et al. Global prevalence of dementia: a Delphi consensus study. Lancet. 2005 Dec 17;366(9503):2112-7.

[4]. Molero AE, Pino-Ramirez G, Maestre GE. High prevalence of dementia in a Caribbean population. Neuroepidemiology. 2007;29(1-2):107-12.
[5]. Jacob KS, Kumar PS, Gayathri K, Abraham S, Prince MJ. The diagnosis of dementia in the community. Int Psychogeriatr. 2007 Aug;19(4):669-78.
[6]. Office of the Registrar General & Census Commissioner GoI, Census Data 2001. Available from: http://www.censusindia.gov.in/Census_Data_2001/India_at_glance/broad.aspx. [Last accessed on 2011 Jun 10].
[7]. Irudaya RS SP, Mishra US. Demography of Indian Aging, 2001-2051. In: liebig PS, Irudaya RS, editors. An Aging India: Perspectives, Prospects, and Policies. Jaipur: Rawat Publications (Indian reprint); 2005. p. 11-26.
[8]. Shaji KS JA, Girish N, Bharath S, Dias A, Pattabiraman M, et al., editors. Alzheimer's and Related Disorders Society of India. The Dementia India Report 2010: Prevalence, impact, costs and services for dementia. New Delhi: ARDSI; 2010. p. 10-55. Available from: http://www.alzheimer.org.in/assets/dementia.pdf. [Last accessed on 2012 January].
[9]. Dias A, Patel V. Closing the treatment gap for dementia in India. Indian J Psychiatry 2009;51:93-7.
[10]. Prince M. The 10/66 dementia research group - 10 years on. . Indian J Psychiatry 2009;51:8-15.
[11]. Vijay Chandra ,R. Pandav, HirokoHayama Dodge et al Incidence ofAlzheimer's disease in a rural community in India: The Indo-US Study ,September 2001 ,Neurology 57(6):985-9 DOI: 10.1212/WNL.57.6.985.
[12]. Jorm, A. (2000). Mental health literacy: Public knowledge and beliefs about mental disorders. British Journal of Psychiatry, 177(5), 396-401. doi:10.1192/bjp.177.5.39.
[13]. Law, Samuel; Wolfson, Christina.The British Journal of Psychiatry; London Vol. 167, Iss. 4, (Oct 1995): 541-544. DOI:10.1192/bjp.167.4.541
[14]. Shaji, K. S., Arun Kishore, N. R., Praveen, L., et al (2002) Revealing a hidden problem. An evaluation of a community dementia case finding program from the Indian 10/66 dementia research network. International Journal of Geriatric Psychiatry, 17, 222–225
[15]. Shaji, S., Promodu, K., Abraham,T., et al (1996) An epidemiological study of dementia in a rural community in Kerala, India. British Journal of Psychiatry, 168, 745–749
[16]. Vas, C. J., Pinto, C., Panikker, D., et al (2001) Prevalence of dementia in an urban Indian population. International Psychogeriatrics, 13, 439–450.
[17]. Jorm AF, Korten AE, Henderson AS. The prevalence of dementia: a quantitative integration of the literature. ActaPsychiatr Scand. 1987 Nov;76(5):465-79. doi: 10.1111/j.1600-0447.1987.tb02906.x. PMID: 3324647
[18]. Ganguli, M., Ratcliff, G., Chandra, V., Sharma, S., Gilby, J., Pandav, R., Dekosky, S. (1995). A Hindi version of the MMSE: The development of a cognitive screening instrument for a largely illiterate rural elderly population in India. International Journal of Geriatric Psychiatry, 10(5), 367–377. doi:10.1002/gps.930100505.
[19]. Hall KS, Hendrie HH, Brittain HM, et al. The development of a dementia screeing interview in two distinct languages. Int J Methods Psychiatr Res. 1993;3:1–28.
[20]. RITCHIE, K. (1992). A comparative study of the performance of screening tests for senile dementia using receiver operating characteristics analysis. Journal of Clinical Epidemiology, 45(6), 627–637. doi:10.1016/0895-4356(92)90135-a
[21]. Jorm, A., Scott, R., Cullen, J., & MacKinnon, A. (1991). Performance of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) as a screening test for dementia. Psychological Medicine, 21(3), 785-790. doi:10.1017/S0033291700022418