

Esophageal cancer early detection program & screening cohort study in China

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Endoscopic examination
with Lugol's iodine
staining and biopsy

Liquid-based balloon cytology

Occult blood detection

Balloon cytology with smears

1970s, In rural high-risk areas of ESCC in China

The Early Detection of Esophageal Cancer Project

- Overall Goal: Reduce ESCC mortality by early detection and treatment of ESCC precursor lesions and early invasive tumors
- Specific Goal: Develop practical clinical techniques to detect and treat these lesions in asymptomatic adults in high-risk populations like Linxian

- **Necessary components:**
- Identification of ESCC precursor lesions
- Primary screening test(s)
- Endoscopic localization
- Staging
- Therapy

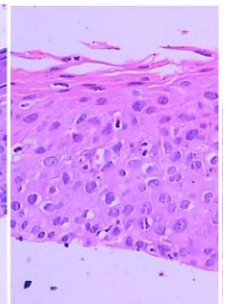
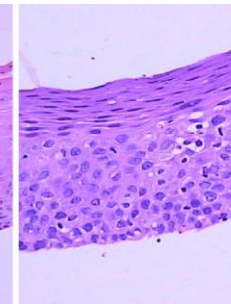
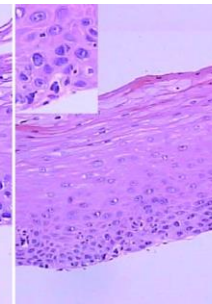
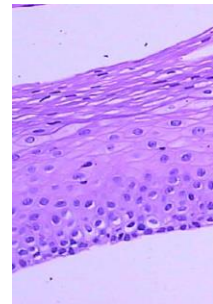
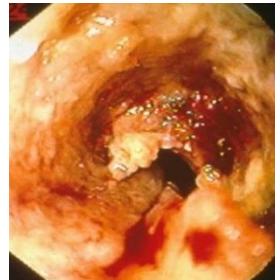


Fig a,
Primary
double
tubes
balloon

Fig b.c
Modified
single tube
balloon

Fig d.
Encapsulate
d sponge
cytological
samplers

Fig e.
Advance
d double
tubes
balloon



BCH

mD

MD

SD/CIS

Impact of ESCC Endoscopic Screening: Evidence from China

(2 grants from Ministry of Science & Technology, China)

The Community Intervention Trial in Cixian, China

- Non-adjacent villages assigned to intervention or control groups
- Intervention = single endoscopy with Lugol's, Bx of USLs >5mm, EMR and/or APC for Bx-proven SD/CIS/T1mESCC
- Follow-up (monthly surveillance + registry) = 10 years

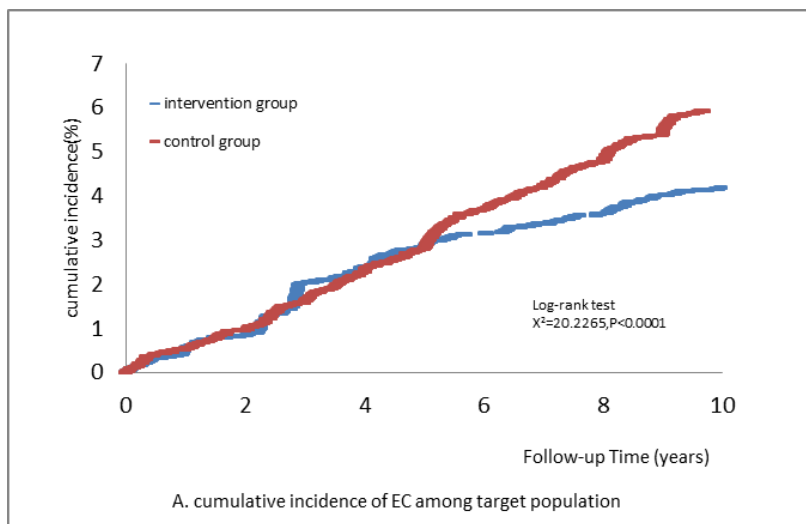
	Intervention	Control	P-value
Villages	14	10	
Population (40-69)	6649	6128	
ESCC cases (%)	285 (4.17)	367 (5.92)	<.001
ESCC deaths (%)	229 (3.35)	313 (5.05)	<.001

- The intervention resulted in a **33% reduction** in ESCC mortality

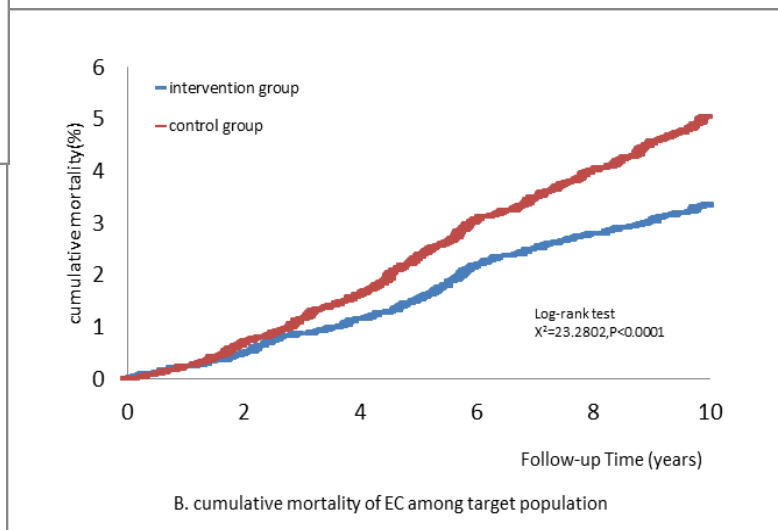


Red region : screening group
Green region : Buffer region
Blue region : Control group

Long-Term Follow-Up of a Community Assignment, One-Time Endoscopic Screening Study of Esophageal Cancer in China



Cumulative **Incidence of EC**
among the target population
4.17% vs 5.92%. reduced **29.47%**



Cumulative **Mortality of EC**
among the target population
3.35% vs 5.05% reduced **33.56%**

Wei WQ, Chen ZF, He YT, Feng H, Hou J, Lin DM, Li XQ, Guo CL, Li SS, Wang GQ, Dong ZW, Abnet CC, Qiao YL. Long-Term Follow-Up of a Community Assignment, One-Time Endoscopic Screening Study of Esophageal Cancer in China. *J Clin Oncol*. 2015 10;33(17):1951-7.

Prospective Evaluation Study of Upper Gastrointestinal Cancer Screening

- **Principal Investigator: Dr. Wan-Qing Chen**
- **Co-PIs: Wen-qiang Wei, Youlin Qiao, et al**
- **Multi-center including the urban & rural areas, high & low incidence areas**
- **Village or communities cluster randomized, controlled.**
 - **Lin county: over 10,000 Endo and biopsy /blood sample collection**
 - **Ci county: 10,000 Endo and biopsy /blood sample collection**
 - **Wu wei: 10,000 Endo and biopsy /blood sample collection**

New project: National precision medicine cohort of esophageal cancer

13th National Key R&D Program of precision medicine

- **Principal Investigator: Dr. Wenqiang Wei**
- **Co PI: Drs. Yushun Gao, Duowu Zou, Yanru Qin, weimin Mao.**
- **Objective:**
 - ✓ **Set up ESCC and its precancerous lesion bio-bank and matched information database**
 - ✓ **Set up Dynamic follow up system linked with National Cancer Registry system and make sure lost rate less than 10%.**
 - ✓ **Established mechanism of open, build together, and share together , Set up platform of biomaterial and matched big data.**

National precision medicine cohort of esophageal cancer

13th National Key R&D Program of precision medicine

Set up five cohorts/projects, including

Project 1: Standardized diagnosis and therapy of later stage ESCC clinical cohort

- ✓ 20,000 cases with blood/issue sample, clinical and follow up information

Project 2: Minimally invasive therapy of early stage and precancerous lesion cohort

- ✓ 2000 cases with blood/issue sample, clinical and follow up information

Project 3: ESCC Genetic linkage cohort

- ✓ 600 family lineage at least two generation with blood sample follow up information

Project 4: ESCC rural high risk area population based cohort

- ✓ 25,000 dysplasia cases with blood/issue sample, clinical and follow up information

Project 5: ESCC opportunity screening cohort based on urban community

- ✓ 5000 dysplasia cases with blood/issue sample, clinical and follow up information

Screening cohorts summary

Cohort	Subject	information	Sample	Follow up
Cohort of esophageal cancer in Ci county in Hebei Province	21653	Questionnaire Cancer Endpoint	Biopsy of dys.	2000-14 yrs
Cohort of esophageal cancer screening program in rural areas (2005-2009)	110974	Questionnaire Endo. Follow Cancer Endpoint	Biopsy of dys.	2005-11 yrs
Cohort of esophageal precancerous lesion in Linzhou demonstration field (2005-2016)	3029	Questionnaire Endo. Follow Cancer Endpoint	Biopsy of dys. Blood sample	2005-11 yrs
Evaluation cohort of Upper GI cancer Screening program	20,000	Questionnaire Endo. Follow Cancer Endpoint	Biopsy of dys. Blood sample	2015-
National precision medicine cohort of ESCC	50,000	Questionnaire Endo. Follow Cancer Endpoin	Biopsy of dys. Blood sample Saliva, cyto.	2016-



Difficult questions on Early detection

✓ Focus on primary screening methods:

- Potential molecular biomarkers (blood sample, cytological sample...) of ESCC or precursors as the primary screening methods to concentrate population to Endo. Exam

✓ Focus on modified Endo-Screening method:

Starting age of, screening interval, and follow up option?

Molecular classification and personalized diagnostic and therapeutic for ESCC Endo. screening

✓ Focus on marker development and evaluation in screening cohort:

- Upper GI tract microbiome and other risk markers

Acknowledgement !!!

